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LONDON, SATURDAY, AUGUST 17, 1839.

REVIEWS

The Journey of Eduard Ludecus through the Mexican Provinces, Tumalipas, Coahuila, and Texas. [*Reise durch die Mex. Prov. &c.*] Leipzig.

THERE is no kind of speculation more important to those immediately engaged in it, as well as to the state from which it proceeds, than emigration; and yet we know of none more unskilfully and wastefully conducted, or which more frequently terminates in loss and disappointment. The emigrant abandons home and friends: he risks his fortune and future prospects in his favourite adventure; and yet in a multitude of instances he fails, not owing to accidental or unwonted calamity, but through his own inadvertence and erroneous calculations. This may be partly ascribed to the great share which the imagination has in laying out and embellishing schemes of emigration. The intending emigrant, figuring in his own mind as the hero of a great physical and social revolution, which is to raise him to wealth, and to unite a hitherto unproductive land to the civilized world in the bonds of commercial intercourse, easily gives way to every flattering suggestion, and adds the delusions of self-esteem to those of hope. The personal share he is to have in the execution of his plans inspires him with over-confidence, and makes dreams of rich prairies, virgin soil, and boundless pastures as dangerous as those of gold mines. Hence it is that we have it in our power to point out individuals, sagacious and well-informed, who have nevertheless within a few years wasted large capitals in experimental emigration, and then when sobered by their losses, entered with humbler hopes on a career of prosperity. To the thousands who have gone to Canada or New Brunswick under the denomination of emigrants, and have subsequently wandered southwards into the United States in the character of beggars, we cannot advert without deeply lamenting, that government did not at an early period take into its hands the business of emigration to the colonies, and conduct it with the courage and liberality which can alone render it successful.

In this country, for some years, the intending emigrant has not been wholly without guidance; but his guides have been generally false, and having no further object than to gain his ear and to pocket his money, have lured him on with a song of the Sirens. More recently, the system adopted in the colonization of South Australia, has been of signal service to the cause of emigration in general, not so much on account of its peculiar economical principles, (on the merits of which we do not here mean to enter,) as for its display of the advantages arising to emigrants from combination, concerted action, and adequate preliminary arrangements. The sad spectacle, of wasted energy; of hopes and fortunes scattered along the margin of the stream of emigration, is one which we trust will not be again frequently presented to our eyes. From these remarks we now proceed to give some account of the volume which has suggested them —a volume, from which, we regret to say, there is little to be learned but the blundering want of method so common among emigrants; their volatility in choice of plans, and their uncandid criminations when disappointed.

Our author's preface informs us, that he laboured for twenty years at a counting-house desk, till, his health declining, he was advised by the physicians to adopt a more active mode of life, and he consequently resolved to emigrate. He devoted two years to the study of the various captivating histories of adventures in the backwoods, and at length made up his mind to settle on the banks of the Missouri. Here, perhaps, it may strike the reader, at the outset, that although the desk-worn clerk might very reasonably hope to improve his health by change of place or rural occupation, yet that there was no likelihood of his being able to compete with backwoodsmen in wielding the axe, or of his ever making himself comfortable in the wilderness of the far West. However, Eduard Ludecus set forth on his way, and found, on arriving at New York, that the land on which he had set his affections was still in the dim distance. The more he inquired, the more was he perplexed by contradictory information, and the less capable was he of forming a definitive resolution. We need not relate the odd remarks made by the old-fashioned German respecting the manners of our transatlantic brethren; nor his astonishment at seeing the legs of Yankees dangling from the windows, while nothing but sundry puffs of smoke announced the vicinity of the trunks and heads appertaining thereto. His description of Mrs. Hossack's boarding-house; of the motley company assembled there; and of the ragged, independent *helps*, all people of colour, is not without humour; but it has not sufficient novelty, in this country at least, to justify our extracting it. Our author acknowledges himself content with the Anglo-Americans in everything except as to their language, of which he knew nothing, and their military. Used to the array of the Prussian legions, he could hardly refrain from laughing at the sight of the American militia.

I had frequent opportunities (he says,) to be present at the exercising of the militia, and was surprised to find that on such occasions, every one does just what he likes: he breaks line; pushes his neighbour out of the ranks for sport; or at the word "about face," he performs a pirouette.

Herr Ludecus himself was not more steady in his evolutions; being at some loss to decide what road to take to St. Louis, in Missouri, he at last got rid of the difficulty of choice by making up his mind to go to Texas:—

This country, he observes, is now the great point of attraction for the land speculators in North America, and many inhabitants of the Western States have left their homes, to go and seek new abodes in Texas. * * The plan last adopted by the Mexican government, was to grant to certain individuals large tracts of country, to be colonized within a given time: if the contract were not fulfilled by the settlement of a certain population within the prescribed period, then the grant reverted, the settlers on it however still retaining whatever property they had acquired. They were furthermore allowed an exemption to a certain extent from import duties. It was under these conditions that Colonel Austin's grant, extending from the shores of the Mexican Gulf to the road leading through Bexar to Natchitoches, (a distance of about eighty miles, and including within it both the great rivers Brazos and Colorado, (which are forty miles asunder,) was quickly peopled. Every family of settlers was allowed a league of land; a single man had a quarter of that extent. From ten to twelve thousand souls are now settled there, and the land already fetches a high price. Many have made their fortunes, and numbers of North Americans continue to pour down from Missouri, Arkansas, and Louisiana, to obtain some of the Northern allotments which are still unoccupied. I had now made the acquaintance of an Irish gentleman, Dr. Beales, who had for a long time practised as a physician in Mexico, and had married the widow of a Mexican of high rank, who possessed one of the above described grants, without being able to fulfil its conditions. Through his own and his wife's connexions, Dr. Beales obtained a grant of seven millions of acres situated partly in Texas, partly in Cohahuila. His visit to New York has a double object. A company has been here formed, to which he has ceded the land for 50,000 dollars, retaining however one-third for his share as a member of the company. He is bound also to conduct the first expedition to the colony at his own expense. He is at liberty to choose 17,000 acres for his own farm anywhere within not less than three miles of the city which is to be built on the Rio Grande, the intermediate space being reserved for the settlers, each of whom is to have 177 acres and a town lot. The remainder of the land is to be sold at two dollars per acre."

Among the many schemes devised of late years for the promotion of colonization, there is hardly one more vicious in its principle than that which assigns over land to contractors on the condition of drawing together, within a certain short period, a given amount of population. An ephemeral success, is, on such terms, all that is needful. The careful selection of the first emigrants, on which the prosperity of a colony so much depends, is altogether abandoned in the eagerness to complete the muster-roll within the prescribed time, and a motive is given for the propagation of delusive hopes and groundless inducements. The system which hurried on, but failed to uphold, the prosperity of the Swan River colony could hardly be expected to succeed in Texas. Dr. Beales, however, set seriously to work to found his colony; he hired a small schooner, and stowed in it three German and three Irish families, besides several speculators, of nondescript rank, and no settled views,—being, in all, twenty-seven men, German, Irish, French, and American. Among the odd fish thus accidentally combining together as founders of society, were two deserving especial notice: first, M. Pepin, a little dandified French showman and pyrotechnist, who, finding the speculation in squibs unprofitable, and sick with the ingratitude of the world, very obligingly consented to swell the ranks of Dr. Beales's expedition. The other remarkable volunteer was a youth rejoicing in the name of Jack Clops, beneath whose ragged attire the experienced eye of our author could discern the brazen polish and bland facility of manner of a London pickpocket.

The schooner, though drawing only seven feet water, entered with difficulty into Aranzasso Bay; and there the colonists having just escaped from the danger of foundering on the shoals, were glad once more to tread on terra firma. But their troubles by land immediately commenced: the country around was a savanna liable to inundation; there was little or no wood; the cold was severe, so that thick ice covered the ground in the morning,—a remarkable phenomenon certainly in the vicinity of the sea shore, and only five degrees from the northern tropic; and, added to this, there were not a sufficient number of tents to shelter all the people. More than half of the motley crew were obliged to trudge along on foot, the only disposable waggon being barely large enough to carry the women and children. Hence arose complaints, and (which was worse) the habit of complaining; and our author—who seems very naturally to take it for granted that somebody ought to have thought for him—exclaims, "What a pity that Dr. Beales's information respecting the country was so superficial, and that his calculations were so incorrect." The Doctor, whose object was to have a certain number assembled on the ground within a certain time, was indefatigable, it is admitted, in his endeavours to reconcile his followers to their lot, and did all which a man of ability and kind disposition could do under the circumstances, to carry them through their troubles. The tedious journey northward, from the place where the party landed, to Bahia, on the river S. Antonio, was not enlivened with any diversity of vexations: there was daily the same sinking in quagmires; hours lost in extricating the engulphed waggons; the same wading by day and shivering by night; the same

quarrelling between the German and Irish volunteers—each of these parties being desirous to take as little trouble as possible for the benefit of the other. The country presented not a single interesting object, except rattlesnakes, which it was soon discovered infest it in great numbers.

The expedition, after much circuitous wandering, of the object of which we find no explanation in our author's pages, at last settled at a spot bearing the inauspicious name of Dolores, on the banks of the Nueces, and about thirty miles from the Rio Grande del Norte: but their money and provisions were all expended long before they arrived on the land destined for their location; nevertheless, they contrived to make merry, and to solemnize the foundation of the colony and of the city of Dolores. Flag-staffs with streamers were erected at the conspicuous points; Dr. Beales, in a cabriolet (so writes our author), rode triumphantly over the ground, and, in the course of the procession, one of his friends seized an opportunity to put a crown or chaplet on his head. Thereat, the North Americans gave vent to their dissatisfaction, crying, "What are they going to do? we don't want a king." Trifling as this incident may appear, it perfectly represents the spirit which was sure to actuate a miscellaneous assemblage of settlers, swept together in the streets of New York. When they were called together, a little after, for the purpose of electing magistrates, it was found that a party had been formed by the North Americans to oppose Dr. Beales, fearful that he, or the company which he represented, might arrogate too much power, and that the individual whom they had fixed upon, as likely to prove a tractable first magistrate, was M. Pepin, the pyrotechnist. This cabal, however, was not wholly successful; yet Pepin's acknowledged powers of playing the puppet, obtained for him the second office in the young state.

Our author, who made the mistake so common among emigrants,—namely, that of engaging in a complicated business, of every part of which he was utterly ignorant—throws all the blame of his disappointment on Dr. Beales. He remains obstinately blind to the fact, that the business of the contractor—or, as the Mexicans call him, the empresario—was simply to found a colony; but that, for the prosperity of that colony and the individual settlers, there was and there could be no warranty beyond the fitness, the energy, and perseverance of those settlers themselves.

It is laughable to observe with what gravity our author contrives to raise accusations against his leader, out of his own ignorance and incapacity. When the settlers first commenced their march to the interior, Dr. Beales divided the party into watches to guard, at night especially, against attacks of the Indians. When this order was first made known to our author, he was struck with consternation. "Had Dr. Beales,—(he observed,) stated in New York that there were Indians in Texas, not a soul would have followed him." The Doctor's concealment of this fact, lowered him very much in our author's estimation. But why should Dr. Beales have entered into the statement of facts, which were open to the knowledge of all the world? If Herr Ludecus did not know that there were aboriginal tribes in Texas, the fault was his own. It would be too much to require of an empresario, that he should be the general instructor of all whom love of adventure or cupidity attached to his train. We admit, however, that the danger belonging to the neighbourhood of the red men, and the inextinguishable hatred which exists between them and the Spaniards, can be learned only on the spot.

The Comanches (says our author) are the most numerous and most warlike of all the Mexican Indians. They fight on horseback with guns, lances, arrows, and tomahawks. They are nomadic and rove about with great droves of horses, two of their women always riding at the head of the column, and with their shrill voices performing the office of trumpeters. They live by the chase, chiefly of buffaloes and wild horses. When these Indians meditate an attack, they ride in single columns with furious speed, then separate and surround their victims. They call the North Americans their friends, yet kill them when they can do so with profit and in secrecy. But it is said, that if a common Indian takes an American prisoner, and then kills him without consulting his chief, he is punished with death. With the Mexicans however, there is no such scruple; against them they wage a war of extermination. The cause of this is easily found in the feeling prevailing on the other side. A Mexican, in praising his rifle would never say, "I could kill a deer with it at a hundred yards' distance," but, "I could kill an Indian."

The friendship, equivocal as it is, subsisting between the Indians of Northern Mexico and the Anglo-Americans, may be ascribed to the peculiar and limited nature of the intercourse which takes place between them. The solitary American hunters, whom the love of the chase leads into the Indian territories, cannot inspire dread, and are under the necessity of conciliating by every means in their power, the good-will of the red men. It is extraordinary how many of these intrepid rovers issue from the Western States. Depending for subsistence, and we might almost add, for guidance, on their rifle, they scour the vast wilds between the Rocky Mountains and the Pacific Ocean, and hover along the Mexican frontiers from California on the one side, to Texas on the other. Our author's party was twice accosted by half-wild Americans of this description, who offered to accompany the expedition to supply it with game; one of these worthies was on horseback, with his wife (a native of Mexico), riding on the crupper behind him. The dread of the red men, of whom our author seems to have had no knowledge when he commenced his campaign in Texas, sank deep in his heart, for on more than one occasion he was on the point of shooting some of his companions, mistaking them, in the moment of alarm, for Indians.

A very short residence at Dolores was sufficient to satisfy one not used to country life, much less to live in a new country. The money of the party, as we have already observed, was all spent, before the work of settlement, properly so called, had commenced; provisions for three months were wasted in one; Dr. Beales had departed to procure new supplies, and with him went the only source of union in the young community. All things were out of joint,—at least, so our author represents them. Water was scarce; wood for building houses was still scarcer. No stones were to be had, nor was the soil found to furnish materials for bricks. Notwithstanding the boasted fertility of Texas, the soil in the vicinity of Dolores proved, we are told, wholly unproductive: nothing grew, or growing, came to maturity in it. It is true, that the first settlers sowed their crops a little out of season; but this circumstance does not induce our author to withhold his condemnation, wherein he assigns over the whole province to perpetual sterility. He therefore resolved on defection, and declared that he would quit the new colony, unless three points were conceded to him: first, the Rio Grande was to be navigable for steam-boats; secondly, that he was to have a thousand acres, one mile from the town; and thirdly, that his grant should include both wood and water. The first of these conditions was impossible to be fulfilled, as the Rio Grande is a shallow stream, with falls throughout its course; it is unnecessary, therefore, to discuss the others.

On leaving the new colony of Dolores, our author visited the town of S. Fernando, in Tumalipas, where he found a Mexican population, living without comfort, energy, or knowledge: neither had they money; they bartered trifles, and for large dealings used oxen as the medium of exchange. As he approached the sea-coast at Matamoras, he found the character of the population growing continually worse; for he observes, "I have always found, the nearer civilization, the worse the men." Matamoras, on the sea-coast in Tumalipas, has risen into importance within the last twenty years. Of its 12,000 inhabitants, one half are foreigners, North Americans, English and French, and to them it owes its prosperity, as well as the little cultivation to be seen in its vicinity; for the Mexican law, which prohibits the exportation of any article of food, condemns the soil in general to lie waste. The intention of the ignorant framers of that law was to make provisions cheap; yet at Matamoras butter cost a dollar a pound; eggs were sixpence apiece, and vegetables still dearer in proportion. Assassinations are so frequent in Matamoras, that their occurrence excites no public interest whatever.

Our readers, we dare say, will readily agree with us in the opinion, that our author's account of his disappointments in Texas will find many parallel examples, wherever there is a stream of emigration. Colonization is a difficult business, not yet reduced to system, but carried on in general at random, and therefore at a great loss. As to the light which his narrative throws on the state of society in Texas, though it is not copious, yet it concurs with all the other information which we have on the subject, to such a degree as to confirm us in our opinion, that the province of Texas is, at the present moment, the sink of the western world. In it will be found blended together, the malignant passions of the ignorant Mexican, and the cold-hearted, low-minded, determined avidity of the North American land-jobber: the pride of the one, and the barefaced want of honour of the other, together with the system of slavery now fully established in Texas, cannot fail to render the population of that province corrupt and hateful to the last degree. In our penal colonies, the children of felons grow up in moral habits, because, in the history of their vicious parents, they read of the force of law, and the sanction of morality; but in Texas, vice passes for virtue; and it is to be feared, that the covetousness, treason, and kidnapping propensities of the parents, will be transmitted to their posterity, without correction, through many successive generations.

A History of British Birds, Indigenous and Migratory, &c.; illustrated by numerous Engravings. By William Macgillivray, A.M. F.R.S.E., &c. Vol. II. *Cantatores, Songsters.* Scott & Co.

Between birds and bipeds of a larger growth, the analogy becomes a mere cipher, if we examine the characteristics of the tribe to which Mr. Macgillivray has devoted the volume before us. Among "human mortals," no class, save, perhaps, that of the *Saltatores*, offers such scanty materials to the biographer as that of the *Cantatores*,—its members are too often thriftless, unskilled in the practical duties of life; and, when the *a altissimo* of a Billington has been sufficiently described, and the triumphs of a Catalani, or a Sontag, in her own peculiar and unapproachable *bomba*, recorded, the rest of their sayings and doings are—a blank. It is not so with the "sweet enchanters of the grove:" setting aside their choral powers, they are ingenious architects, thrifty housekeepers, economical purveyors, sagacious rulers of families—in short, as intelligent, busy, and engaging a group as is to

be found among the winged part of creation: and Mr. Macgillivray, fully alive to their merits, has, by noting down their peculiarities, furnished not merely a valuable contribution to the ornithologist's library, but, to the lazier and less scientific student of nature, a most agreeable volume of summer and out-of-door reading.

It is in the latter point of view that we shall consider this book, and content ourselves with stating that it contains copious and minute dissertations on the generic peculiarities of the Cantatores,—reasons at full for the classification which the author has adopted,—and anatomical outlines, and sketches of their internal structure. One remark, however, as containing a result, is intelligible and suggestive enough in its detached state to be laid before the reader. While discussing the lungs of the Rook, the vocal organs of the Linnet and Wood-pigeon, and the trachea of the Parrots,—"such then," says Mr. Macgillivray, "is the apparatus by which the voice of the Cantatores is attuned."

"The modifications of these organs presented by the different species of this order, are slight, and in all those which I have examined, I have found the same parts, and the same number of muscles. The peculiar songs of different species must depend upon circumstances beyond our cognition, for surely no one could imagine that the Raven, the Hooded Crow, and the Rook, require as complex an apparatus to produce their unmusical cries, as that which the Blackbird, the Song Thrush, the Nightingale, and the Linnet employ in modulating their voice, so as to give rise to those melodies which are so delightful to us; and yet the knife, the needle, and the lens do not enable us to detect any superiority in the Warbler over the Crow."

Having noted this singularity, we will at once, and finally, leave the lecture-room, with its skulls, skeletons, and bottled preparations, and go forth into the open air. The first family of the Cantatores is, according to Mr. Macgillivray, that of the *Myrmotherinæ*, but one member of which, the European Dipper, is to be found in Great Britain. This is the angler's familiar, the bird "that now and then presents itself to the wandering naturalist, as it flits along the streams, or is seen perched on a stone in the midst of the water, the white patch on its breast rendering it conspicuous at a great distance,"—that finds its food beneath the surface of the stream, which it traverses with a motion erroneously described by some naturalists as *walking*,—and has as many diving tricks wherewith to escape its pursuers as the cunning Rob Roy himself:—

"In August 1834, (says our author,) I shot a Dipper on Mannor Water, in Tweeddale, when it flew off, dived, and hid itself under a bank, on which I forded the stream and endeavoured to secure it, but it slipped out under water, swam down the current twenty yards or so, and got under a large stone, where it was traced. The introduction of the gun-rod only caused the persecuted bird to retreat as far as it could, and while I was employed in removing some pebbles and gravel from behind the stone, it slipped out under water, and proceeded down the stream a considerable way before it rose to breathe."

The Dipper, too, is original in his notions of settlement,—loving to build his house in the dank, crumbling wall of the mill-dam or weir, the closer to the dashing water the better, if we are to judge by a figure of such a habitation which Mr. Macgillivray has given. Another nest, also here pictured, was built on the banks of the River Avon, "in an angle between two small fragments of rocks, under a small cascade, and, although the water fell upon part of the dome, the compactness with which it was put together rendered it impenetrable."

With the next family of the songster tribe, the *Turdinæ*, we are introduced to some of our sweetest (*bravura*) singers. But they still make good the text with which we started, by their ingenuity and sagacious habits. The nest of the Golden Oriole is a capital piece of architecture, being "described by authors as of an oblong form, shaped like a purse, having its aperture above, and suspended from a forked branch, generally towards the top of the tree;" but the Golden Oriole is a migratory bird, confining itself chiefly to "engagements" in Spain, France, Italy, and Germany, and visiting England rarely; whence it comes that Mr. Macgillivray only describes it from hearsay. He is far more positive, and far more graphic, when noticing the enormous appetite of the Blackbird, that is hardly to be exceeded by the most capacious *tenore primo* who ever frequented *La Ville de Naples*, of Parisian gastronomic celebrity—whether the energetic singer be busily digging out his Christmas feast of worms, or "when gooseberries in season" he be "feeding from sunrise to sunset, save when he betakes himself to the pond to wash." The Blackbird's gluttony, however, has one unamiable feature—it is solitary; which is all the stranger, inasmuch as,—

"Compared with the Song Thrush, it is a very lively bird, and it is amusing to observe one that has just alighted on a twig, and see how gracefully it bends forward, throws up its tail, jerking it at intervals, depresses and at intervals flaps its wings, and then perhaps flits to another branch, where it performs the same motions, or alights on the wall, hops along, suddenly stops, jerks its tail, flaps its wings, and then commences singing."

The Blackbird's season of full song is just our Opera season—from the middle of February to the beginning of August. Of the sweetness and variety of his tones, Mr. Macgillivray speaks in raptures not extravagant; he is a substantial architect, and a careful master of the house, though not particularly fastidious in his tastes, in more ways than one. He has been known, in his natural state, to mate with a thrush; such mis-alliances between different houses being, as all naturalists know, uncommon among birds, save when in captivity. Finally, Mr. Macgillivray informs us that his flesh is excellent to eat, though a traditional feeling among the poorer classes prevents them from seeking for it as an article of food.

Next to the Blackbird comes the Fieldfare, which no such scruple banishes from the epicure's table, the flesh, according to Mr. Macgillivray, "being tender and sapid;"—after him, the Missel Thrush, a shy and suspicious bird, with good reason for his shyness, if it be permitted to us to generalize from the observations of the author's pains-taking friend, Mr. Weir. This gentleman, besides counting the number of meals the Missel Thrush makes, has not merely noticed this bird flying past with a dead hedge-sparrow in his mouth, but declares that his gardener watched one murder its own offspring. Next, the Song Thrush, whose strains, irregular and various as the different movements assembled by Purcell in one mad song, have excited Mr. Macgillivray to the enthusiasm of committing poetry. But to this we shall prefer a fact of curious prose:—

"The food of the Thrush is chiefly found on the ground, and consists of snails, earth-worms, larvæ, coleoptera, heps, berries, and seeds of various kinds. Helix aspersia, hortensis, and nemoralis supply great part of its food in winter. It breaks the shells by raising them in its bill, and knocking them repeatedly against a stone. Large heaps of the shells thus broken may be seen by garden walls, and in pastures on the edges of thickets. In the Hebrides, where it frequents the shores in winter, it treats the Turbo littoreus and Trochos conuloides in the same manner; and of these shells the fragments may often be found under shelter of some stone or slab, to which the bird flies with its prey. Many years ago, having in the course of my littoral rambles in Harris frequently heard a sharp sound like that of a small stone struck upon another, I endeavoured to discover its cause; but for a long time in vain, until at length being one day in search of birds, when the tide was out, I heard the well-known chink, and standing still discovered at a distance, in a recess formed by two flat stones at the upper part of the shore, a bird moving its head and body alternately upwards and downwards, each downward motion being followed by the noise which had hitherto been so mysterious. Running up to the place, I found a Thrush, which flying off, left a welk newly broken, but with the animal in it, lying amidst a heap of fragments around a smooth stone. Having some years after mentioned the circumstance to a scientific friend in Edinburgh, I was favoured with an assurance of the utter impracticability of the feat, which indeed is at first mention not very credible, although one may easily satisfy himself that a welk, thick as it is, is very easily broken by knocking it smartly against a hard body."

The Song Thrush, too, sometimes exhibits those caprices in choice of abode, so nearly resembling the freaks of human eccentricity. In 1833, a pair built their nest on the end of the shaft of a threshing-machine in Bathville farm-house, and there brought up five young ones.

The next family is made up of the *Alaudinæ*, among whom figures prominently "the lyrique Lark" of the old English writer, Shelley's "blithe spirit," and Wordsworth's "pilgrim of the sky:" that bird, in short, which has inspired the poets of Nature to burst forth in their most ecstatic song. Who can have forgotten Shelley's verse?—

> All the earth and air,
> With thy voice is loud,
> As, when night is bare,
> From one lonely cloud
> The moon rains out her beams, and heaven is overflowed.

or Wordsworth's lines:—

> Leave to the Nightingale her shady wood,
> A privacy of glorious light is thine.

But we must not run riot in drawing upon the poets to panegyrize the Grisi of birds (if, following out our first fantasy, the parallel be permitted); being unable to make room for Mr. Macgillivray's more matter-of-fact remarks on the songster's habits of flight, feeding, its careless building, and its behaviour at home, which is more than commonly sedulous and affectionate. The Skylark must surely possess the organ of philoprogenitiveness strongly developed. Mr. Weir has known an individual who for many years "has acted as a faithful step-father, having brought up a number of his own species, likewise several broods of linnets. And, what is still more wonderful, I saw a lark, which was only a few weeks old, assisting him most assiduously in giving food to a family of young birds."

Cousins to the Larks are the Pipits. The meadow Pipit, conceived by Montagu to be the Tit Lark, in its complete or winter plumage is the bird to whom the vagrant Cuckoo—that burglar and unnatural parent—most commonly consigns the offspring it abandons:—

"A circumstance, (says our author,) which had not eluded the observation of our country people, who, having often seen the 'Gowk' followed by the 'Titling,' employ the comparison derisively in speaking of a parasite and his patron, not aware that here the larger and more patron-looking animal is really the parasite."

The next family is that of the *Motacillinæ*, to which belongs the well-known Wagtail—that impudent, nimble bird, equally at home, whether pattering across the strip of mud or sand which girdles some brook, or perching upon the back of a cow ruminating in a meadow. The vicinity of man, even when busy with the noisiest occupations, (and, stranger still, those of which the noise is capricious and irregular,) dismays him not. The Wagtail, with his almost printless feet, haunts the hob-nailed traces of the ploughman:

"In the silvermine-quarry, says Mr. Weir, in the neighbourhood of Bathgate, in May, 1836, a pair of Pied Wagtails built their nest in an old wall, within a few yards of four men, who during the most part of the day wrought at the limestone, which they occa-

sionally blew up with powder. There the female laid and hatched four eggs. She and the male became so familiar with them that they flew in and out without showing the least signs of fear, but if I approached (so quickly did they recognize a stranger) they immediately flew off, and would not return until I had departed at least five or six hundred yards from their abode. At Colinsheils Coal-work, in the parish of Bathgate, Linlithgowshire, in May, 1837, a pair of Pied Wagtails made choice of a singular situation where they erected their abode. It was beneath the strike-board, the wooden platform upon which the hutches, when filled with coals, are put. Although they struck against it with considerable force every time that they were drawn up to the top of the pit, the Wagtails nevertheless brought up to maturity a family of five young ones."

After the *Motacillinæ*, come the *Saxicolinæ*, who chiefly, as their name, in fact, imports, "reside in stony places and open pastures." This family is by no means eminent for the compass or execution of its songsters, but many of its members make up in sociability what they want in skill. The Hedge Chanter will sing at night, and in winter too; and what need is there to dwell, for one line, upon the well-known gifts and graces of that household favourite, "the little English Robin"? Mr. Macgillivray, however, aided by Mr. Weir, does them full justice. The Stone-Chat, or Wheatear,—the earliest of our Summer visitants, according to our author, and, a bird, too, in England, esteemed as not unworthy of an Ude's notice,—is ingenious, though, considering its shyness of disposition, something "innocent," according to the northern acceptation of the term, in its choice for settlement of stony slopes in the vicinity of pasture grounds—whence its Gaelic name Clacharan, or Little Mason,—not even rejecting such fragmented places as Arthur's Seat and Salisbury Crags, within reach of every Edinburgh schoolboy.

We must not tarry with the two last families included here among the Cantatores; the *Sylvianæ* (Warblers, &c.,) and the *Parinæ*—though the former, besides including other interesting birds, the Wood Wren, for instance, ought to take the highest rank in any ornithological herald's college, as numbering among its names that of THE NIGHTINGALE! Even concerning this bird, we must keep silence—save to hazard the remark, that the choir of bards of all ages have proved themselves but indifferent natural historians by their constant descriptions of "sad Philomel's song." Alas! for the reality of all the pictures of the widowed bird who

> — all forlorn
> Leaned her breast up till a thorn!

the "jug, jug"—concerning which rhymesters have raved, since the days of Ovid, being nothing more or less picturesque, than a male ditty of courtship. Nay, to go one step further, according to Audubon, who is here quoted, Philomel is a personage little more sentimental than Punch himself—for a French peasant favoured the American woodsman, when a boy, with this authentic version of her (his) "richest melancholy."

> Le Bon Dieu m'a donné une femme
> Que j'ai tant, tant, tant, tant, battue,
> Que s'il m'en donne une autre
> Je ne la batterais plus, plus, plus, plus, &c.

With this precious interpretation, we must close our *fantasia* concerning the Cantatores. Mr. Macgillivray is so pleasant a companion, that we are sorry to part company with him.

The Adventures of an Attorney in Search of Practice. Saunders & Otley.

WHEN, on casting an eye over our book advertisements, we met with the announcement of this volume, we took it for granted that the work itself contained an ironical display of the crooked arts by which a cunning and unprincipled man may insinuate himself into the confidence of the public, and worm his way from obscurity to practice. Such books have been very fashionable in our times, and not without some show of reason; for the humour is open to the most ordinary intelligence, and it carries conviction, where a graver reduction to absurdity fails to convince. The roguery of attornies has, however, become a commonplace; it is the staple of every farce, the jest of those who can joke on nothing else; and we were, on that score, prepared to find in the volume so announced little amusement and less utility. In every respect we were mistaken: the 'Adventures of an Attorney' are those of an upright, honourable, and educated man, thrown upon his own resources to establish a business; they are calculated to raise, rather than to degrade, the profession; they contain a great deal of amusing speculation on the wayward workings of the human mind, with striking illustrative anecdote; and in point of utility, they are not more serviceable in directing the young attorney to his client, than in enabling the client to choose his attorney, and in leading persons, who may have nothing to do with law, to a clearer insight into the action of individual peculiarity upon business in general. The character of the work is humorous, but the humour is of that quiet and gentle cast which never outsteps the modesty of likelihood, proceeding from just that sense of the ridiculous which we believe to accompany, in most cases, a keen and prompt perception of matters of fact, —the concomitant of that turn of intellect which ripens experience into wisdom, and makes the practical apprehensiveness of a clever man of business.

Were this volume a mere illustration of the relationship of attorney and client, however great its merits, we should have contented ourselves perhaps with the briefest possible notice; but a clever attorney is and must be, in the force of the term, a man of the world; and to develope such a character, is to expatiate in a wide field of general moralities, to lay open some of the most whimsical and intricate folds of the human disposition. The volume is, therefore, a book of mind, that sets the reader thinking; and it is as much the affair of the man of speculation, as of the parties to whom it is more immediately addressed. Lest, therefore, other people may fall into our mistake, or be misled from the title-page into considering the volume as interesting only to the parties concerned, we are tempted to introduce it more formally to our readers.

For this purpose it is not necessary to enter upon an analysis of the contents of the work, or to proceed, chapter by chapter, with its matter and developement: a few extracts will at once explain the volume itself, display the mode in which the subject is treated, and prove more amusing in the perusal than any statement of our own is likely to be. It will be sufficient to state, that each chapter is intended to illustrate its own peculiarity in the attorney's intercourse with his client, and the whole to embrace the principal difficulties and niceties of conduct which arise out of the different sorts of business transacted in an attorney's office.

First, then, concerning the qualities necessary to this legal character, and the value of a sharp practitioner, let the author speak for himself:—

"A great mistake obtains among the junior branches of the profession, and perhaps among many of all ages out of it, as to the qualities which are peculiarly desirable in a solicitor. It is rightly assumed that he must possess a certain share of legal knowledge; though even here, if I may judge by the prosperity of many, less will serve his turn than is commonly supposed: a liberal education *ultra* the law, is mostly, but very erroneously, regarded as mere accomplishment. I am ashamed to say of my brethren, that I know too many among them, the style of whose composition would disgrace a chambermaid, and the tone of whose manners would exclude them from the butler's pantry. I know not one however, of this description, who has ever attained, or even aspired to a higher rank in it, than that which might be allowed to a sheriff's officer, or a money-lending Jew. Honesty, in the ordinary and limited sense of the term, is generally presumed as a qualification of course, though ill-natured people do say that it is rather an extraordinary professional trait. All, however, are agreed, that to a greater or less extent, according to taste and the character of his business, law, general knowledge, and common honesty are required in an attorney: but discuss the desirable a little further, and we find the usual definition given of the desiderated animal is that he shall be 'a sharp, clever fellow.' * * I am bold enough to say not only that your 'sharp, clever fellows' make your worst attornies, but that they rarely gain admission to the higher classes of respectable clients: this sounds a little paradoxical, but there is sufficient reason for it. The sort of cleverness which obtains this reputation for an attorney, is to be found in every office on very cheap terms. Every common law or chancery clerk (as a piano that has been *practised* on for two or three years, arrives at its prime) is after a short probation, pre-eminent for it; and no office of any extent in business is without a convenient appendage of this kind, whose special duty it is to set snares and catch an opponent tripping. * * Among respectable men, however, these paltry contentions are despised, and also discouraged; because they tend to create angry and vindictive feeling, without any counterbalancing advantage. * * It generally happens that clerks who spend their noviciate in learning this cleverness, pique themselves so much on the acquisition of it, that they learn but little else; and when they enter upon practice on their own account, have no other accomplishment to bring to their aid. Hence their minds degenerate; their business is low, because it is chiefly in low business that such smartness enables them to shine; and even low and vulgar clients very soon discover, that while in the progress of a cause, these 'sharp, clever fellows' are daily met and defeated by pleaders and counsel, if not by attornies, as sharp and clever as themselves, their sharpness is frequently turned upon their employers, of whose dulness they can render very profitable account! * * If I were asked to define the professional character to which I should most willingly trust myself, in an affair of delicacy or importance, involved in intricate details of circumstance, and entangled, perhaps, with much of personal and private feeling, I should select a man distinguished by calm energy, a clear head, and sound common sense: if in addition to this, he were gifted with a cheerful disposition, and marked, not by fastidious delicacy of mind, but by that enlarged honesty which is usually intended by 'honourable principle,' I should consider that he possessed the finest qualities for a useful attorney."

The following portraiture must be familiar to more than attornies, and it is cleverly drawn:—

"There is a very large and a very profitable class that may be described as the 'wrong-headed.' Wrong-headedness may spring from temper, from timidity, from ignorance, and a multitude of causes.—The wrong-headedness to which I am now alluding, is an infirmity of itself, more nearly allied to pride perhaps, than to any other kindred spirit, but distinguishable in many points even from that. It is an obstinacy of that peculiar character that will resolutely act for itself, even while it admits its inability to judge, or to collect the materials for judging correctly. It acknowledges its own dulness; it seeks to be enlightened; it professes an eager anxiety to 'see its way clearly;' it owns to perplexity; and acknowledges inexperience. * * 'I admit all you say, Mr. Sharpe; there is a great deal of truth in it; perhaps you are right; only it does seem to me that I must go on as I proposed.'—'Then, Sir, you will assuredly subject yourself to costs, and probably to disappointment.'—'It is very honest in you to say so, Mr. Sharpe; but I own I have formed my opinion long since.'—'Your opinion was formed under a mistaken view of the case: you now see your position better.' —'Yes, but I am not apt to be mistaken.' * * * 'You have not understood before how destitute you are of evidence,'—'Yes: but I may find some better evi-

dence yet.'—'Then the legal point is doubtful, if you do.'—'That's true: but I must trust to counsel for that. It strikes me that I must go on.' * * 'I feel it my duty to say that I think your determination a rash one.'—'I am very sorry for that, Sir; very sorry indeed; but if you are unwilling to undertake the cause, I must consult Mr. Darall.'—And if you remain honestly firm to your opinion, no matter how rational or how disinterested, you lose your client. Here is a choice of difficulties: take up the cause and fail, and the failure is not thrown on your client's obstinacy, not even by his own conscience, but on your ignorance and irresolution: should you succeed, the probability is that you lose his confidence hereafter, because your success gives the lie to your own predictions. Reputation is endangered either way, for I know to my cost, that a character for being too cautious is as fatal to professional repute, as the opposite extreme of temerity. These wrong-headed customers are the most profitable of any, when they do happen to be right; this however, is but seldom, for if they do not find a post in their way, they will soon make one to run their heads against. On the whole, I dread a 'but' and a 'yes, but' client."

Concerning the lower class of attornies, and the rules to be observed by the honest practitioner in any enforced business communications, we find much practical good sense and knowledge of the world, useful to all men who may have the ill-luck to encounter such dangerous personages. There is also much important knowledge of the world contained in the author's remarks on what he calls "awkward cases." Among these stand prominent, interferences in family disputes; and on this point every man may have thrust upon him occasions to profit by our attorney's experience.

"The case of all others that demands the greatest caution and address on the attorney's part, is that of imputed infidelity to the conjugal vow; on whichever side the charge arises, it is to be received with suspicion, for it is usually made before it is well-founded, and when once made it has a direct tendency to substantiate itself. * * The first thing to be considered in reference to this point is the temper in which the complaint is made: and here I may observe that jealousy is rarely prominent where certainty exists; nor is even violent excitement often exhibited where a settled conviction of conjugal guilt is entertained; if I see a man actuated by very strong and bitter feelings, I infer, that whatever ground he has for suspicion, it is after all only suspicion; and hence that my primary duty is to allay it, unless he discloses facts that ought to be conclusive to an unbiased mind, or that are too unequivocal not to call for inquiry; even when this is the case, that inquiry must be conducted in the most cool and dispassionate temper. Artful servants, mischief-making friends and gossiping relations, are wont to put the worst construction on conduct that may amount to no more than thoughtless levity, blameable but not decisive. The manner of some men is naturally *empressée* towards females, without any criminal motive; others from mere foppery affect an air of gallantry, or a tone of sentiment, which rightly interpreted, means no more than they are thinking of themselves in preference to anybody else, whether male or female; and often have I seen this coquettry returned, by married women too, so *sympathetically*, that plain matter-of-fact people would set it down to improper intimacy, while others of more acuteness or more knowledge of the world would only laugh at the deception each party was practising on the other, and probably on himself. Yet incidents and scenes like these are ill-naturedly treasured up by some of the good folks I have mentioned, and, when a sufficient hoard of them is amassed, liberally bestowed on the 'injured husband,' as a charitable donation by some pious friend, and like all charitable donations most gratefully accepted: the unfortunate husband is of course made vigilant, officious servants are set upon the watch, and to vindicate their claim to confidence tell twenty lies for one word of truth; the husband kicks his wife out of doors—loads his pistols—sends for his friends—his friends for the doctor and a straight waistcoat—and after proper commotion, and a decent interval, all hurry away to the attorney, who, without more ado, retains Serjeant Wilde, issues the writ, and from that moment all go their own way to the devil! Instances sometimes occur where even less doubtful indications of guilt prove in the event to be utterly fallacious. A gentleman once consulted me in a case in which with all my distrust in such matters I could not help arriving at his conclusion; but happily we discovered our error in time to avoid mischief. He had been informed by one of those pests of society, the 'lady's maid,' that his wife received unusual attention from a young clergyman, who was a frequent and welcome visitor at the house, and moreover that a clandestine correspondence had long been carried on between them: a 'good night kiss,' too had twice been noticed, and duly commented on below stairs, and sundry other little liberties of no individual importance, but of large aggregate amount, proclaimed a very good understanding between the parties. After much uncomfortable espionage that led to nothing more decisive, the husband intercepted one of the aforesaid letters, and was at once convinced of his dishonour. He brought it to me without an hour's delay; and on the perusal of it and hearing of the previous occurrences, I quite concurred in his impression; with his approbation I immediately went to the lady, to intimate the necessity of her taking refuge with her friends. I found the fair one in gay spirits, seated on the sofa with the young gentleman by her side, and her sister next to him. I was embarrassed by the frank and cheerful reception I met with from all the trio. 'You are just come in time, Mr. Sharpe, we want your help.' I looked as grave as possible, while I inquired the occasion. 'We have lost a love-letter, Mr. Sharpe, and Alfred, here, is half mad about it.'—'I have it in my pocket, Ma'am,' I replied with awful gravity.—'Let me have it, my good Sir; do give it me directly;' cried the sister, suddenly jumping up from the sofa, and all but offering to search my pocket. 'Stay, Caroline; have patience: Mr. Sharpe, how did you obtain that letter?'—'From your husband, Madam,' still maintaining the most inflexible severity of features, but I could not preserve it long; they looked at each other at first with some blushing confusion that confirmed my impressions. * * As soon as she recovered herself, the lady quietly asked me whether I had read the letter, and on telling her that I had, she inquired with playful anger, how I dared to pry into other people's correspondence. 'Your husband desired me.'—'And how dare *he* presume to open it?'—'Because it was addressed to you.'—'So you neither of you noticed the C below the seal! that letter is my sister's, Sir; and now allow me to introduce you to Mr. and Mrs. Lawrence! they were married a week ago, and have been engaged these six months!!!' I looked like a fool, no doubt; it was clear enough that the acuteness of woman's wit immediately penetrated my errand, and a man never looks so silly as when abashed by woman's superiority: the mystery was soon explained; the clergyman expected a living from his uncle. * * An attorney cannot be too cautious in receiving the first statement of a husband's dishonour, or too doubtful of the evidence by which it is proposed to establish the fact: where, however, the proofs are irresistible, even there he is not at liberty at once to bring the action. I have already noticed that in all such affairs, there is assuredly fault on both sides. This will always appear on the trial of the issue, if the action is not collusive; and then both parties leave the court irretrievably damaged, and the children, as a matter of course, are excluded from the pale of society. * * Before he sanctions by his advice, proceedings of which the consequences are so terrible and so extensive, it becomes him to satisfy himself that the exposure may not be shared by both husband and wife, and thus orphanize their issue. It is the more important because I have too often seen that in the impatience of redress on the one side, and the eagerness of self-vindication on the other, all parental anxiety is absorbed in selfish feelings, and the claims of the infant are forgotten by those who are especially bound to protect them."

A large part of the work is made up of anecdote, often told with considerable dramatic effect, but we are prohibited by the limitation of space from doing justice to these characteristics. On the whole, we may recommend the volume as indicative of the healthy state of mind and feelings which went in its production; and we may add, that had the author affixed his name to the title-page, it would have probably saved many a client the trouble of a long search after the attorney in whom he is desirous of placing confidence on a trying occasion.

The Landgrave, a Play, in Five Acts; with Dramatic Illustrations of Female Character. By Eleanora Louisa Montagu. Smith, Elder & Co.

The authoress of this volume is a lady whose smaller pieces have now been some years before the public, as contributions to our periodical literature. They are characterized by more vigour of thought and more independent action of mind than are common with lady poets; and, in their combination of fine womanly feeling with pictorial expression, and a strain of reflection somewhat masculine in its kind and reach, remind us more of Miss Jewsbury than of any other of the daughters of song in our day.

It is probably owing to her possession of the particular qualities at which we have hinted, and some intimation of her friends to that effect, that Miss Montagu has been induced to try her powers in their present direction, and that the whole of the pieces in the volume before us have taken the dramatic form. In composing the drama which is its principal feature, her object, she says, was to produce a work which should be especially adapted for the stage; and her view in now offering it to the public, is to obtain the candid criticism of those better able than herself to pronounce on its capabilities as an acting play. We must then honestly tell Miss Montagu that it is an entire miscalculation; and, evincing as the work does, considerable talent, it is deficient in nearly all the requisites which should ensure it stage success. In so far as the Drama is a mirror to hold up to society the reflex of itself—a picture to represent truths which are eternal,—not, however, in their shape of abstractions, but with the very "form and pressure" of the times,—it is clear that a young lady in the retirement of her study is not in the most favourable position for acquiring the necessary experiences. The workings of the passions, under the many modifications of circumstances, are, happily, the lessons which she is least, and last, likely to learn; and the experience of some centuries (since Shakespeare,) has proved, that the inspiration by which such knowledge is communicated in the form of a perfect revelation, under circumstances the most unpropitious, is a gift given (when given at all) once only in the lifetime of a nation, and ranking afterwards amongst its miracles. Enthusiast after enthusiast has followed *his* chariot of fire, but none have caught his mantle. Again, even for that species of melo-dramatic production which we have, on former occasions, stated to be the drama of *our* day, and characterized as the Picturesque Drama, Miss Montagu is, and for the same reasons (though in a lesser degree), unfitted: she is deficient in power over the elements of stage effect. The value (and secret) of striking situations and startling denouements—in fact, the picturesque arrangement of the plot, with the whole class of *coups de théâtre*, are the results of an apprenticeship which Miss Montagu has yet to serve, and the essentials of that lower order of drama which modern audiences are content to take in lieu of the spiritualized drama of other days. A play without any of these qualities, even where it contains much poetic beauty, and coldly illustrates some abstract truth, is after all but the dry bones of the drama. 'The Landgrave' is meagre in plot, and deficient altogether in action; and there is none of that fine marking of character, which is the very essence of drama, as Shakespeare understood it. We make these remarks only because we believe Miss Montagu

to be capable of distinguishing herself, and desire to convince her that she will not do so in this direction. The one moral, which her leading drama is intended to enforce, might have been wrought out in some other form in which she may fairly promise herself success. Its hero is the victim of a false suspicion. Circumstances have combined to charge him with the murder of his predecessor on the throne of the Landgraviate, estranging from him the hearts of his subjects as a consequence, turning his spirit into bitterness, and making him finally a tyrant and a broken-hearted man. The whole of this is, however, explained to the audience in the soliloquies of the victim himself, and the dialogues of the other interlocutors,—not by any arrangement of events which pass before the eyes of the spectators; and the dramatic probabilities are at the same time violated by the meagre thread—the mere filament which, at every moment, it is felt might be broken — which holds together a sequence of causes leading to so heavy a result. Many of these remarks will apply to all the other dramatic sketches in the volume — with this further one—that in a sketch introducing real characters and professedly historical, the falsification of history is, in our view, a fault,—though Miss Montagu may plead abundant authority for it, — and some of the highest. In selecting the dramatic form, she is unnecessarily encumbering her own path with difficulties, of which she seems to be conscious. "In thus restricting myself," she says, "to what was alone necessary to representation, all mere poetical passages, which would have no influence on the conduct of the plot, but which might have rendered the play more acceptable to the reader, have been carefully avoided." Here, then, Miss Montagu has sacrificed that which is her substance, for a shadow which has eluded her. Without that fine apprehension of the shades of character which is not a rare gift, and that power of painting them which *is* one of the rarest of all, there can be no dramatic excellence; and where these do exist, the poet will be often compelled to sacrifice what might beautify his text for want of an appropriate voice amongst his characters to utter it. These are trivial sacrifices where the higher qualities of the drama are purchased by them,—but impose a needless fetter where they are uncompensated. Earnest, therefore, for the success of all who are gifted as we believe Miss Montagu to be, we will conclude these remarks by a word of advice. In her preface to the present volume, she states, that should its success be such as she desires, she "may, perhaps, be inspirited to carry into effect a design which has for some time occupied her thoughts,—that of endeavouring to seize and mould into one dramatic whole those passing visions of female mental loveliness which descend upon our path, like angel visitants,

> To show us how divine a thing
> A woman may be made!"

We are not sure that we understand Miss Montagu's intention; but, if we *do*, we think the didactic form much better fitted than the dramatic for its successful execution. Miss Montagu may be assured that both the design and her own powers point to any other shape rather than that of the drama.

As a specimen of Miss Montagu's poetry, we will extract for our readers a passage from the last of the 'Dramatic Illustrations of Female Character' which her volume contains, entitled 'The Bride of the Alps.' An Invocation to Love is sung before the door of *Bertha*, the heroine, about to be a bride on the morrow, by her peasant companions and a student who is sojourning among them. Our readers will perceive, amid the beauty of the poetry, an example of one of the faults, dramatically speaking, to which we have alluded: it is unsuited to the singers—altogether unlike such an epithalamium as would be sung by Alpine peasants—though beautiful and appropriate had Miss Montagu herself been the singer.

INVOCATION TO LOVE.

Student.

Spirit of Beauty, that in upper air
Thy wings in dews of Eden steepest,
Oh hear!
Where'er
Thy throne thou keepest,
Or far, or near,
In ether pure, or 'mid the cloudlands fair!
—Cast down thine alien bow!
Which first unto thy faltering hand was given
When thy young form the Grecian fabler drew
In ages long ago;
Ere yet, by thee inspired, he knew
To robe thee, mercy-like, in hues of heaven,
Or paint thee meek in humanizing woe!

Peasant Girls.

From out thy starry home above
Look down—look down, sweet Love!
Thy chosen one beholding;
Where, in joy subdued, she stands—
Her gentle hands
Across her throbbing bosom folding!

Student.

Spirit divine!
Wherever shine
Those stars—those soul-awaking eyes of thine,
—Whose bluer orbs make the blue sky seem pale,
Till, envy-filled, she draws a veil
Of earth-born clouds before our mortal view—
Look down—look down!
Thou, gentlest Love! art mortal too,
In all save death:
Thy brows are girt with an immortal crown;
And, though thou feelest every sigh
That hovering waits on human breath,
Thou canst not die!

Lena.

Oh! bend thine eyes upon the weeping earth,
Which since its earliest birth
Like a poor orphan, filled with sorrow-fears,
Hath walked in tears!

Student.

Thou art an orphan, Love!
Thy history's page was yet unrolled
When in that dim tale of old
They gave thee Beauty for thy mother.
—There lived not another
Like unto thee in all those worlds above!
Thou stanchest, as thou ever stood'st—alone.
Homeless thou art,
Save in the universal heart
Of man, whose soul adopts thee for his own.
Some unimagined being was thy sire,
Some glorified and crowned Spirit,
From whom thou dost inherit
Thy deep devotion's heavenly fire:
Thy mother, born where humbler planets roll,
Lent thee thy soft humility of soul!

Peasant Girls.

Unchanged, unfaded by the passing hours,
Sweet Spirit, thou art ours
In woe or weal:
Thou knowest and canst feel
How many joys our bosom-shrine surround;
All ties,
All human sympathies
Keep thee for ever to that altar bound.
If 'neath the holy light of day
Thou sportest with the child at play,
Thou fillest up the little space
Between it and its mother's face,
Till it can nor feel—nor see
Aught on earth save her and thee:
While, as she smooths its clustering hair,
Her tears fall on thee unaware!

Student.

Before thy throne the Poet kneels in prayer!
He hears thy footstep in the softening shower,—
Thy voice amid the storm;
And sees thy form
In every flower!

Lena.

And we who walk in darkness—we, too, feel
Thy chastening presence round us steal:
Ah! who our wounds should heal,
If thou wert far?
And if, alas! we blindly war
In an unnatural, unholy strife
With thee,—our Strength—our Fountain—and our Life!
'Tis but thy mortal part which we would cast
Back on the dark and perishable Past.
Oh! pardon, mighty Love!
In that our mortal hearts are anguish-riven:
In vain
We burst our chain:
Thou reignest still whose kingdom is above—
Conquered on Earth, but glorified in Heaven!

[*As their voices cease, all kneel before Bertha and lay the offered flowers at her feet.*]

Bertha.

Thanks—thanks, my friends!—But, Lena, dear Lena, your voice sounds in my ear like a dirge. I fear 'tis a bad omen:—yet, no; I am so full of joy to-day, that all sights and sounds seem bright, and sweet, and beautiful.—Must you go? Farewell then. [*All go out save Bertha.*]

Bertha.

—Yes, holy Love! thou'rt an immortal spirit;
Still, spirit-like, thou bindest our young thoughts
We know not why—unseen, but not unfelt,
Down to the lowly earth where we were born.
How beautiful it is—this moving world,
Mountain and river, lake, and grassy dell,
Its woods—its streams—its fountains, and its flowers!
Oh, beautiful, most beautiful! Mine eye,
Delighted, lingers o'er each snowy crown
Of Alpine grandeur, and my thrilling heart
Leaps to the flow of waters! Fairy-like,
Sweet music wanders o'er the breezy heights
Where sounds my hunter's horn,—and, hark! afar
The answering voice of echo wildly peals,
Gladdening the stilly morn, from peak to peak!
O'er the green hills swift wings the mountain bird
And bounds the chamois to his native glade!
While sweetly sounds from out our cottage home
My mother's voice!—Oh, happy, happy world!
Each sight—each sound with melody and joy
Fills the rapt spirit of the Alpine Bride!

We must observe, in justice to Miss Montagu, that this is not, nor indeed do we find in the volume, one of the highest specimens which we could adduce of her unquestionable powers.

The Life of James Watt. By M. Arago.

[Concluding Notice.]

Hitherto we have spoken of this biography with approbation. We now turn to that portion of the work which is devoted to the elucidation of Mr. Watt's achievements in reference to the steam-engine, a section more technical, and it may be more dry, but the most material in a history of the creator of the modern steam-engine. Here we regret to say that M. Arago ceases to be the generous advocate of truth, which we have found him throughout the other pages of the work. One capital error pervades the whole of his writings on steam,—an endeavour to impress upon his readers, that it was the French who invented the steam-engine! and that Mr. Watt merely carried their invention to a higher degree of perfection!! At this point M. Arago has now been labouring for about ten years; and there can be no doubt but that the authority of his great name, joined to his eloquent eulogiums, his insinuating manner of putting the question, and his happy combination of such instances, as, though true in themselves, yet lead insensibly and irresistibly those who are not better informed to false conclusions, has carried the willing French, and the simple among other nations, into a very satisfactory persuasion that the world is indebted to France for the steam-engine.

We have for many years watched this strange fancy of M. Arago with regret and wonder. We have taken little notice of his singular and strange writings on this subject, as they have hitherto appeared only in an ephemeral shape, where they served the purpose of amusing a circle of unlearned readers, whose convictions upon the matter were to us and to every one matter of very little consequence. We have often, indeed, for M. Arago's own sake, regretted that he should have undertaken so hopeless a task, and we have tried to account for it upon the least unworthy motives. We imagined, for example, that as M. Arago rejoices in the character of political economist as well as savant, he was desirous to draw the attention of his countrymen more strongly to the advantages of the steam-engine, so as to accelerate their progress in imitating the English in the general introduction of it as a manufacturing power; and in this point of view it appeared to us not unlikely that M. Arago, with his well-known knowledge of human character, deemed it the best way of conciliating the minds of the French to the introduction of an English invention. By such palliatives as this, we endeavoured to soften down our disapprobation of that which at the time strongly roused our indignation, as a most incorrect statement, in which some truths and many errors were skilfully interwoven.

But now the case is changed—M. Arago has ventured to register his fictions in the page of

history. He has presumed so to distort the truth that he might leave no prominent characteristics in the history of the steam-engine but the names De Caus and Dr. Papin; and from the completion and perfecting of their labours he would make Watt appear to derive his fame! This error will be handed down to posterity engrossed in the archives of the Institute of France, and there, disguised in the eloquence and seeming candour and generosity of one of the most fascinating and accomplished of modern scientific writers, it will be received as most welcome truth by those whom its contradiction may never reach.

The nature of our work does not permit us to enter fully into the details of this long protracted misrepresentation, which has found its way into the heart of this Eloge. We shall, however, endeavour to lay before our readers a concise statement of the truth.

In the history of the steam-engine there are but three great eras—the era of philosophical toys—the era of useful but imperfect applications—and the modern era. The first extends over two thousand years, from Hero to Kircher—the second over one century, from Worcester to Smeaton—the third is the age of Watt.

In the first era, the heat of the sun was employed in expanding the air of the atmosphere, and the vapour of water, to make musical sounds, to turn about dancing figures, to make statues perform miracles, to turn roasting-jacks, and make picturesque jets of steam and of water play in the air.

In the second era, Worcester invented a useful machine, and constructed an engine of two-horse power, which was employed in raising water forty feet high to the top of a tower for the supply of the inhabitants in the vicinity. Savary and Newcomen improved it, and effected its general introduction for draining mines, and Smeaton gave it all the perfection of which its principles then admitted. But it was still an expensive and unmanageable machine, inferior in cheapness and efficacy, in many places and for many purposes, to the labour of men and horses. Watt made the steam-engine a perfect machine, much more economical, manageable, and efficient for almost all the purposes of motive power, than the force of the strongest or most docile animal; not only more regular and more controllable than any of the elements, but more powerful as well as constant.

In the first era, many of the principles of steam were known and thoroughly understood. Steam was included, as it is by modern writers, under the head of the airs or gases, and was said to consist of water turned into air by heat. This has misled M. Arago, for, being apparently acquainted with the works of the Greek philosophers only through the medium of translations, he seems to imagine that when they speak of air producing a given effect, they mean only atmospheric air, whereas they fully explain themselves to mean water turned into air, using the word generically, not specifically, just as we should say water converted by heat into the gas or vapour commonly called steam. Therefore, he infers, that they were ignorant of the principle of generating steam from water for their peculiar purposes, and asserts that the effects mentioned are attributable only to the gaseous matter of our atmosphere,—whereas, Hero, of Alexandria, more than a century before the Christian era, understood the subject of the generation of steam from water by heat, and its application to turn machinery, philosophical toys, or worse, engines devoted to the service of superstition and idolatry; for the steam-engine, which is now the servant of the best interests of mankind, and, in alliance with the paddle-wheel and the printing press, one of the most powerful agents for the diffusion of knowledge and civilization, was employed in those ages to work miracles before the eyes of the ignorant and deceived people, to pour out wine and oil on their sacrifices, to open wide the heavy gates of the infernal and supernal regions, to pronounce the oracles of false gods, and to rivet with all its power the chain of degraded slavery on the necks of the people. These machines were not endowed with great power. If they opened a door, or emptied out a phial of oil, or made a jet of steam sustain a light ball dancing in the air, or gave out sounds as it passed through the throat of a brazen dragon, or whirled round the figures of a choral dance, it did no more. But it is a remarkable fact, of which M. Arago appears not to be aware, that Hero's simple engine of emission is *at this moment* in use, both in this country and in America. We know of one steam engine of Hero's, of twenty-one horses' power, and its only fault is the consuming too much steam and fuel. It is, otherwise, a simple, cheap, and effective steam-engine. When the revival of learning, towards the conclusion of the dark ages, exhumed once more the knowledge of the Greeks, Hero's work was one of the first productions of the press. It gave an excitement to the mechanical talent of the age—many ingenious men imitated and extended the contrivances of Hero, and produced ingenious mechanical toys; and Gerbert, Cardan, Mathesias, Baptista Porta, Solomon de Caus, Giovanni Branca, Cornelius Drebel, Kircher, and others, imitated the machines of Hero, and made some modifications of their structure, and extended their applications.

Out of this group M. Arago selects one of the least distinguished—Solomon de Caus—and endeavours to exalt him to the pedestal of fame as the inventor of the steam-engine, because, forsooth, he took up the inventions of Hero, and slightly modified them. The following are the facts of the case:—1, It is not known of what country De Caus was a native; 2, It is well known that he was engineer and architect to Charles the First, and was employed in designing hydraulic ornaments for his palace at Richmond; 3, That he dedicates the second part of his work to Charles's sister, the Electress Palatine; 4, That he resided, for a time, at Heidelberg; 5, That a French edition of his work was dedicated to the king of France, in whose service he appears, at one time, to have been engaged; 6, That, amongst other things in his book, he describes a machine for throwing up a jet of water, in a manner similar to Hero's steam jet; an invention which he does not even claim as his own, but describes amongst a number of others; "*dont il se peut faire diverses machines, j'en donnerai ici la démonstration d'une.*"

On this slender ground M. Arago builds the following theory:—1, That De Caus was certainly a Frenchman! 2, That this machine, described by De Caus, to make a small jet of water play ornamentally in the air, was certainly his own invention, and was, literally, a steam-engine suitable to the purpose of draining mines of water!! 3, That Solomon de Caus is the inventor of the steam-engine!!!

To this we reply,—1, That De Caus may have been a German, a Frenchman, an Englishman, or a Jew; 2, That De Caus is, in all probability, only describing the invention of another, and that he puts forth no claim to originality; and 3, That the invention, if his own, is a mere machine for projecting an ornamental jet of water for a garden, inferior to many of Hero's toys.

But we cannot but believe that M. Arago himself is aware of the weakness of his cause; for, in explaining the machine of De Caus—which he calls a *véritable machine à vapeur, propre à opérer des épuisemens*—he has not inserted De Caus's own drawing of the machine, which would have at once shown its nature as a trivial and useless toy; but he gives a figure and description of his own invention, so altered as to lead his reader to suppose an effect produced of a different and important character. Herein we cannot but think that M. Arago's candour appears for a moment to have yielded to his desire to flatter the vanity of his countrymen, and render himself popular.

In the second era, the era of successful application of the power of steam to useful purposes, we find, first of all, the Marquis of Worcester. There is no doubt whatever urged by M. Arago, against the authenticity of the Marquis's written and published descriptions of the steam-engine, but he contents himself with asserting that the Marquis never made his machine! nor applied it to use, and that therefore *he* stands on no better ground than De Caus. It is to be regretted, that M. Arago did not make himself better acquainted with the published history of the steam-engine, for he would then have known that the Marquis of Worcester not only made a steam-engine, but that it was applied to the purpose of raising water for the use of the inhabitants of Vauxhall; that it was of more than two-horse power, and that it was seen in operation, amongst others, by Cosmo de' Medici, on the 28th day of May, 1653, who gives testimony thus—"it raises water more than forty geometrical feet, by the power of one man only; and in a very short space of time will draw up four vessels of water through a tube or channel not more than a span in width, on which account it is considered to be of greater service to the public, than the other machine near Somerset House;"—the machine at Somerset House being one driven by two horses.

In brief, let M. Arago say what he may, Worcester, Savary, Newcomen, and Smeaton, are the great names of this era; and Dr. Papin, though he made many clever attempts at the contrivance of machines, on the principles suggested by his predecessor, the Marquis of Worcester, and his cotemporaries Savary and Newcomen, was never known to make a single successful attempt with steam, except in applying it to the extraction of nutriment from bones, an invention which still bears his name, and for which alone it is that futurity will ever mention it.

In the last era we find only the name of *Watt;* he made the steam-engine a perfect machine, giving out in useful labour at one end all that is put into it in the shape of caloriferous fuel at the other. To his invention, in so far as M. Arago enters upon its examination, he does full justice, resting it however always upon the foundation of De Caus and Papin. We regret that the limits of this notice do not permit us to enter fully into the matter of dates and quotations, on which M. Arago erroneously founds the claims of the French, but the account we have here given is the only one that appears to us consistent with truth and justice.

Anecdotes and Traditions, illustrative of early English History and Literature, &c. Edited by W. J. Thoms, Esq. Printed for the Camden Society.

As we do not rank ourselves among those learned Thebans who conceive that all useful knowledge must, of necessity, be dull and wearisome, and that illustrations of the history and manners of our forefathers can be authentic only in proportion as they are prosy, we are content to receive this volume as a contribution from the Camden Society, although many of the collected *ana* were already known to us, and probably, therefore, to many of our readers. The first and most important division of the work has been derived from the Harleian MSS., No. 6,395, entitled, 'Merry Passages and Jests, compiled by Sir Nicholas Lestrange.' This knight was the elder

brother of the essayist and pamphleteer, Sir Roger, and the son of Sir Hamon L'Estrange, who was knighted on the arrival of King James the First, and died on the 31st of May, 1654. His epitaph, placed over his remains, as Mr. Thoms conjectures, by the anecdotist, is a whimsical illustration of the latter's turn for the facetious, —its English portion running thus:

> In Heaven at home, o blessed change!
> Who while I was on earth was Strange.

Concerning Sir Nicholas, it is sufficient to add, that he died fourteen months after his father, aged fifty-two:—concerning his collection of *ana*, that it was, for the most part, made up on the authority of his own and his wife's family, the Lewkenors—and that it consists, in the original, of six hundred articles, of which Mr. Thoms has selected only one hundred and fifty-one, a large portion of the remainder being too gross for the taste of the day. There are few among those selected by him to which the editor has not affixed some pertinent gloss or commentary. So much, by way of preface to the specimens which we are about to give. Many of them illustrate the strong tendency towards quip and conundrum which characterized the intercourse, as well as the literature of the age—*ex. gr.*:

"*Pedantry and Puns.*—Dr. Collins and Dr. Field, being to dispute before King James, had promised one another to lay aside all extravagancie of witt, and to buckle to a serious argumentation; but they soone violated their owne lawe, for Field beganne thus: 'Sic disputas, Colendissime Collins,' and Collins againe to him afterward, 'Sic disputas, Ager Colende.'

The superlatives of this anecdote were evidently formed in the same school as one which created much merriment on King James's visit to Cambridge in 1614-15; when the University Orator, Sir Francis Nethersole, on complimenting the Prince of Wales, addressed him as *Jacobissime Carole*; 'and some (adds Mr. Chamberlain) will needs add, that he called him *Jacobute* too; which neither pleased the King nor any body else.' Bishop Corbet, in his 'Grave Poem,' written on this occasion, thus versified the Orator's exordium:

> "I wonder what your Grace doth here,
> Who have expected been twelve yeare;
> And this your son fair *Carolus*,
> That is so *Jacobissimus*."

Here is another of the same family—the original, as Mr. Thoms notes, of an anecdote written by Benjamin Franklin to his daughter, Mrs. Bache, in a letter commenting on a proposed order of American knighthood:—

"*Omnia Vanitas.*—Old Burleigh the Treasurer, hearing much fame of a gentleman's house in Suffolke, for the rarities to be seene there, went to visit him, and had presented to his view varietie of pretious gemmes, meddalls, birds, a wedge of Ophir gold (which certainly was an imposture, for the gentleman was but shallow and credulous, and easy to be deluded, for he had payde dear for many sophisticated things), choice of pictures, statues, and every roome embroidered with mottoes and devises; but at last he brought Burleigh into a roome where he would shew him a piece of infinite valew for the antiquitie, and that was Solomon's statue, cap-a-pie, cut while he lived (but it appear'd plainly to be an old weather-beaten statue of some ancient Philosopher), and his owne motto under, but thus written: 'OMNIA VANITAS;' which when the Treasurer observed in so different a character, and purposing to put a grave slye squibbe upon him, 'Sir,' sayes he, 'this does not well; I would advise you to alter by any meanes; for methinkes OMNIA is very little and VANITAS exceeding greate.' 'My Lord,' sayes the gentleman (not apprehending the acute dilemma of his speech), 'it shall be done; for to speake truly, *Vanitas* hath been thus here a long time, and I crowded in *Omnia*, but I'le have my painter make them all one before your Lordshippe comes againe.'"

A third exhibits a divine bandying pleasantries with "gentle King Jamie," who, as all the world knows, had a somewhat inordinate tendency to the use of expletives:—

"*An out of the way Reproof.*—King James being hunting in the North, was forc't out of the field by a tempest, and a church being the nearest building, there he takes sanctuarie, and thrusts into an obscure and low seate, being very meanly habited and attended. The minister had newly stept into the pulpitt, and spyed some beames of his Majestie through all those cloudes, but tooke no farther notice on 't. He falls to his worke, dicotomizeth his text, and proceeds a little way very logically with the parts: at last he suddenly digresses cleane from the point, and falls into a bitter declamation against swearing, and runns out all his sand upon that subject. The Sermon ended, the King sends for him to dinner, and when they were merry, 'Parson,' says he, 'why didst thou flee so from thy text?' 'If it please your Majestie,' sayes he, 'when you tooke the paines to come so far out of your way to heare me, I thought it very good manners for me to steppe a little out of my text to meet with your Majestie.' 'By my saul, mon,' sayes the King, 'and thou hast mette with me so as never mon did!'"

As illustrating the manners of the day, we may remark, that more than one repartee of Archie Armstrong, the king's fool, is chronicled, and more than one jest, verbal and practical, played off upon or by private persons of less note, who, without having taken out a Court licence to wear the cap and bells, were still recognized by the same honourable title; one Wiggett, of Norwich—who appears to have been the club-bearer to the Company of St. George, and to have distinguished himself by the indelicacy of his freedoms—making a notable figure as "the famous facetious Foole." But here follows a passage which brings us into more worshipful company:—

"*How Sacrifices should be performed.*—Ben: Johnson was at a taverne and in comes Bishoppe Corbett (but not so then) into the next roome; Ben: Johnson calls for a quart of *raw* wine, gives it the tapster: 'Sirrha,' sayes he, 'carry this to the gentleman in the next chamber, and tell him I *sacrifice* my service to him;' the fellow did so, and in those words: 'Friend,' sayes Dr. Corbett, 'I thanke him for his love; but pr'y thee tell hym from me hee's mistaken, for *sacrifices* are allwayes *burn't*.'

This anecdote, illustrative of the love of good liquor in general, and *burnt sack* in particular, manifested by Bishop Corbet, is confirmed by Aubrey; who, in his Lives (ii. 293), after telling us, what we can readily believe, 'that his conversation was extreme pleasant,' adds, 'His chaplaine, Dr. Lushington, was a very learned and ingeniose man, and they loved one another. The Bishop sometimes would take the key of the wine cellar, and he and his Chaplaine would goe, and lock themselves in and be merry. Then first he layes downe his episcopal hat,—"There lyes the Dr." Then he putts off his gowne, "There lyes the Bishop." Then 't was, "Here's to thee, Corbet," and "Here's to thee, Lushington."'

The next transports us from the "Mermaid" to Alsatia:—

"*A Cut-purse Cut.*—A gentleman at a play sate by a fellow that he strongly suspected for a cutt-purse, and, for the probation of him, took occasion to drawe out his purse and put it up so carelessly, as it dangled downe (but his eye watcht it strictly with a glance), and he bent his discourse another way; which his suspected neighbour observing, upon his first faire opportunitie, exercised his craft, and having gott his booty beganne to remove away, which the gentleman noting, instantly drawes his knife, and whipps off one of his eares, and vow'd he would have something for his mony. The Cutt-purse beganne to sweare and stampe, and threaten. 'Nay, go to, Sirrah,' sayes the other, 'be quiete; I'le offer you faire, give me my purse againe, here's your eare, take it, and be gone.'"

The items which follow, if not already appropriated, may be added to some future edition of 'Joe Miller':—

"*Never branded before.*—A rogue was branded on the hand, and before he went from the barre, the Judge bade them search if he were not branded before. 'No, my Lord, I was never branded *before*.' They search't and found the marke. 'Oh you're an impudent slave, what thinke you now?' 'I cry your Honor mercy,' sayes he, 'for I ever thought my shoulders stood behind.'"

"*Honesty rewarded.*—A gentleman overtakes in the evening a plaine country fellow, and ask't him how far it was to such a towne. 'Tenne miles, Sir,' sayes he. 'It is not possible,' sayes the gentleman. 'It is no lesse,' sayes the fellow. 'I telle you it was never counted above five.'—'Tis tenne, indeed, Sir,' says the fellow—and thus they were arguing *pro et con* a long time. At last sayes the countryman to him, 'I'le tell you what I'le doe, Sir, because you seeme to be an honest gentleman, and your horse is almost tyr'd, I will not stand with you, you shall have it for five; but, as I live, whosoever comes next shall ride tenne.'"

"*A House full of Tokens.*—The Earle of Arundell, Lord Marshall, had the sole patent for coining of new farthings, with a distinct marke for their currency (because many were counterfeited before); and when he went embassador to the Emperour the Mint house was well stor'd but lock't up until his returne. The sicknesse being then in London, and poore people wanting their coine, some knave or other in the night, clap't a redde crosse upon the dore, and thus underwritt it: 'Lord have mercy upon us, for this house is full of tokens.'"

"*Cathedral Music.*—One comming into a cathedrall, whose quire consisted of very ill voices, and made a lamentable noise, said, 'Sure the prophecy of Amos was there fulfilled, cap. viii. v. 3; And the songs of the temple shall be howlings.'"

"*No upright Judge.*—Judge Richardson, in going the Westerne Circuite, had a great flint stone throwne at his head by a malefactor, then condemned, (who thought it meritorious, and the way to be a benefactor to the Commonwealth, to take away the life of a man so odious,) but leaning low of his elbow, in a lazie reckless manner, the bullett flew too high and only tooke off his hatt. Soone after, some friends congratulating his deliverance, he replyde, by way of jeast (as his fashion was to make a jeast of every thing), 'You see now, if I had beene an upright Judge (intimating his reclining posture) I had been slaine.'"

"*A great Difference.*—In Lynne their Maior is allwayes chosen out of the twelve Aldermen, and they out of eighteen others. One of the eighteen being at Rising (an ancient but decayed burrow-towne), and the then Maior a mechanicke man, a butcher or the like, sayes he: 'Mr. Maior, I heare you have a very odd forme and manner of election here of your Maior.' 'Why, how is that?' sayes the Maior. 'Why, they say for certaine that you and all your brethren goe into a barne, where every man hath his bottle of hey layde him for a cushion: then ther 's a calf turn'd in at the barne dore, and looke to what bottle the calfe goe first, hee's the man.' 'Why then,' sayes he, 'I see the difference betwixt us and our brethren at Lynne; wee choose with one calfe, and you with eighteene.'"

"*No Fear of Change.*—When the Lord of Carnarvon was going to travaile, and one bad him take heede he did not change his religion. 'Ther 's no feare of that,' sayes he, 'for by ——, no man living will be so madde as to change religions with me.'"

"*How to tame a King's Horse.*—King James mounted his horse one time, who formerly used to be very sober and quiet, but then began to bound and prance. 'The de'le o' my saul, Sirrha,' sayes he, 'and you be not quiet, I'se send you to the five hundred kings in the lower House of Commons; they'le quickly tame you.'"

"*The Practice of Piety prejudicial.*—The towne of Tiverton is mentioned as a fearful example of God's judgment for the prophanation of the Sabbath (being twice burnt), in a booke intituled 'The Practice of Pietie;' and being a third time burn't, and a brief procured, and a Devonshire man collector, the very memorie of the probable occasion of the former flames cooleth the charitie of many that remembered the storie, and was objected to the collector, who replyed that 'there was no truth in it, and the "Practice of Pietie" had done them much wrong'—which words bearing a double sense occasion'd much laughter."

"*A Poor Nobleman.*—Sir Jostlin Percy, being told that the Councell had fined him 1000 markes, laught exceedingly at it. One askt him the reason. He answered, that 'the Privy Councell were so wise as they knew where to find 1000 markes; for hang me if I know where to find 1000 pence,' sayes he."

"*A glass too little.*—Capt. Robert Bacon, revelling at Sir W. Paston's, had his sack served him in a curious Venice glasse, but very much under the size that he us'd to trade in. After a long contemplation of his measure, 'Sir William,' sayes he, 'if you value this glasse (as I beleeve you doe) tye a good long

string to it, to draw him up againe, for, before —— I shall swallow him down at one time or other.' " '

" *Where the Wise Men came from.*—Sands, a gentleman of a bold spirit and witt, being called to shrift by Lenthall (then Speaker to the House of Commons) and some ridiculous and impertinent interrogatories put to him, was askt at last what countriman he was. 'Of Kent,' sayes he, 'for I will neither blush at my name or native soyle; and now, Sir, I pray let me demand the same from you?' 'I am out of the West,' sayes Lenthall. 'By my troth,' sayes Sands, so I thought, for I am sure all the *Wise Men* came out of the East.' "

" *A legal Bull.*—A controversie being at Bury Assizes, about wintering of cattell, before Baron Trevers, then Judge upon the Bench, and the demand being extreame high, 'Why, Friend,' sayes he, 'this is most unreasonable; I wonder thou art not asham'd, for I myself have knowne a beast winter'd one whole summer for a noble.' 'That was a Bull, my Lord, I beleeve,' sayes the fellow; at which ridiculous expression of the judge, and slye retorted jeere of the countryman, the whole court fell into a most profuse laughter."

Enough of Sir Nicholas L'Estrange! To his selected jests, Mr. Thoms has added another MS., from the Lansdowne collection, in which the well known John Aubrey had noted down certain popular usages and traditions, as materials towards a work comparing the superstitions of the classic nations with those of the north. This MS., however, had already been ransacked by Sir Henry Ellis, on which account we shall refrain from extract. The third MS., making up the collection, is the common-place book of a Mr. John Collet, which was hardly worthy of the annotations so liberally supplied by Mr. Thoms.

The Principles and Practice of Levelling, by E. Jones.—A useful treatise, possessing the great qualifications of simplicity, comprehensiveness, and brevity.

Draper's Juvenile Naturalist.—We have read this little work with pleasure; it is well calculated to instruct youth in the first elements of natural science, and at the same time to elevate their moral character, by extending their sympathies with the animal creation.

The Life-Book of a Labourer.—A collection of feeble tales, "pencillings," reminiscences, and autographic fragments, scraped together with more diligence than good taste.

The London and Southampton Railway Guide.—A useful little volume, illustrated with maps, to which is added a Guide to the Isle of Wight, the Channel Islands, and the opposite coast of France.

List of New Books.—Darwin's Journal of his Researches in Geology and Natural History, royal 8vo. 18*s.* cl.—History and Topography of Ashbourne and Valley of the Dove, with Illustrations, 8vo. cl. 11*s.*, royal 8vo. proofs, 19*s.*—Macbrair's Sketches of a Missionary's Travels in Egypt, Syria, &c. post 8vo. 7*s.* 6*d.* cl.—Haddon's Farmer's Account Book, new edit, folio, 7*s.* 6*d.* hf-bd.—White's Abstract of General Geography, 17th edit. 12mo. 1*s.* hf-bd.—Nugent's Dictionary (French), new edit. pearl, 5*s.* 6*d.* bd.—Loggon's Corderius, new edit. 12mo. 2*s.* bd.—New Week's Preparation, Bent's new edit. Part I. 1*s.* 6*d.* bd.—Confessions of a Thug, by Captain M. Taylor, 3 vols. post 8vo. 1*l.* 11*s.* 6*d.*—The Cloud of Witnesses, by the Rev. J. S. M. Anderson, Vol. I. 8vo. 10*s.* 6*d.* cl.—Godwin's Churches of London, 2 vols. 8vo. 32*s.* cl., large paper 48*s.* cl.—Valery's Travels in Italy, 8vo. 16*s.* swd.—Boileau's Traverse Tables, royal 8vo. 8*s.* 6*d.* cl.—Claridge's Guide along the Danube, new edit. fc. cl. 8*s.*—Gilbert's New Map of Europe, 4 sheets, 18*s.* sheets, 1*l.* 12*s.* case, 1*l.* 16*s.* black roller, 2*l.* 2*s.* mahogany roller.—Gilbert's New Map of England and Wales, with Companion, 12*s.* sheets, 18*s.* case, 25*s.* black roller, 30*s.* mahogany roller.—Frey's Hebrew and English Dictionary, new edit. 8vo. 14*s.* cl.—Whewell's Bridgwater Treatise, 7th edit. 8vo. cl. 9*s.* 6*d.*—Frank Howard's Science of Drawing, Part II. "Animals," fc. 4*s.* cl.—Tegg's Hand-Book for Emigrants, 12mo. 4*s.* cl.—Manchester as it is, 18mo. 4*s.* cl.—Campbell's New Testament, 12mo. new edit. 4*s.* 6*d.* cl.—Morrison's Parents, fc. 3*s.* 6*d.* cl.—Pritchard's Memoirs of the Rev. James Smith, fc. 3*s.* cl.—Wilberforce's Eucharistica, new edit. enlarged and improved, 2*s.* 6*d.* cl., 3*s.* 6*d.* roan, 5*s.* morocco.—Maxims, Morals, and Golden Rules, fc. 2*s.* cl.—Rippon's Selection, new edit. 32mo. sheep, 2*s.*—L'Histoire de France racontée à la Jeunesse, par M. l'Ame Fleury, 18mo. 3*s.* 6*d.* cl.—Ince's Outlines of English History, 4th edit. 18mo. swd. 1*s.*—Ince's Outlines of French History, 18mo. swd. 1*s.*—Taylor's Hymns for Infant Minds, 31st edit. 18mo. 1*s.* 6*d.* hf-bd.—Chambers's First Book of English Composition, 12mo. swd. 6*d.*—The Young Botanist's Guide, 18mo. 1*s.* sewed.

REPORT OF THE PRESIDENT AND COUNCIL OF THE ROYAL SOCIETY

On the Instructions to be prepared for the

SCIENTIFIC EXPEDITION TO THE ANTARCTIC REGIONS.

(AUGUST 8, 1839.)

THE PRESIDENT AND COUNCIL OF THE ROYAL SOCIETY having recommended to Her Majesty's Government the equipment of an Antarctic expedition for scientific objects, were informed by the Lords Commissioners of the Admiralty that it had been determined to send out Captain James Clark Ross on such an expedition, and the Council were at the same time requested to communicate to them, for their information, any suggestions on those subjects, or on other points to which they might wish Captain Ross's attention to be called, in preparing the instructions to that officer.* The Council, having due regard to the magnitude and importance of the question submitted to them, considered that they would best fulfil the wishes of Her Majesty's Government, by a subdivision of the inquiry into different parts, and by referring the separate consideration of each part to distinct Committees, consisting of those members of the Society who were especially conversant with the particular branches of science to which each division of the inquiry had relation. These several Committees, namely, those of Physics, of Meteorology, of Geology and Mineralogy, of Botany and Vegetable Physiology, and of Zoology and Animal Physiology, after bestowing much time and great attention in the investigation of the subjects brought under their notice, have each drawn up very full and complete Reports of the results of their labours. These reports have been considered and adopted by the Council, and have been incorporated in the following General Report, which the Council present as their opinion on the matters which have been referred to them by Her Majesty's Government. They take this opportunity of declaring their satisfaction at the prospect of the benefits which are likely to accrue to science from the expedition thus liberally undertaken by the Government on the representations made to them by the Royal Society and other scientific bodies in this country, and in conformity with a wise and enlightened policy. They also desire to express their grateful sense of the prompt attention which has been uniformly paid to their suggestions, and of the ample provision which has been made for the accomplishment of the various objects of the expedition.

SECTION I.—PHYSICS AND METEOROLOGY.

THE Council of the Royal Society are very strongly impressed with the number and importance of the desiderata in physical and meteorological science, which may wholly or in part be supplied by observations made under such highly favourable and encouraging circumstances as those afforded by the liberality of Her Majesty's Government on this occasion. While they wish therefore to omit nothing in their enumeration of those objects which appear to them deserving of attentive inquiry on sound scientific grounds, and from which consequences may be drawn of real importance, either for the settlement of disputed questions, or for the advancement of knowledge in any of its branches,—they deem it equally their duty to omit or pass lightly over several points which, although not without a certain degree of interest, may yet be regarded in the present state of science rather as matters of abstract curiosity than as affording data for strict reasoning; as well as others, which may be equally well or better elucidated by inquiries instituted at home and at leisure.

1. *Terrestrial Magnetism.*—The subject of most importance, beyond all question, to which the attention of Captain James Clark Ross and his officers can be turned,—and that which must be considered as, in an emphatic manner, the great scientific object of the Expedition,—is that of Terrestrial Magnetism; and this will be considered: 1st, as regards those accessions to our knowledge which may be supplied by observations to be made during the progress of the Expedition, independently of any concert with or co-operation of other observers; and 2ndly, as regards those which depend on and require such concert; and are therefore to be considered with reference to the observations about to be carried on simultaneously in the fixed magnetic observatories, ordered to be established by Her Majesty's Government with this especial view, and in the other similar observatories, both public and private, in Europe, India, and elsewhere, with which it is intended to open and maintain a correspondence.

Now it may be observed, that these two classes of observations naturally refer themselves to two chief branches into which the science of terrestrial magnetism in its present state subdivides itself, and which bear a certain analogy to the theories of the elliptic movements of the planets, and of their periodical and secular perturbations. The first comprehends the actual distribution of the magnetic influence over the globe, at the present epoch, in its mean or average state, when the effects of temporary fluctuations are either neglected or eliminated by extending the observations over a sufficient time to neutralize their effects. The other comprises the history of all that is not permanent in the phenomena, whether it appear in the form of momentary, daily, monthly, or annual change and restoration, or in progressive changes not compensated by counter changes, but going on continually accumulating in one direction, so as in the course of many years to alter the mean amount of the quantities observed. These last-mentioned changes hold the same place, in the analogy above alluded to, with respect to the mean quantities and temporary fluctuations, that the secular variations in the planetary movements must be regarded as holding, with respect to their mean orbits on the one hand, and their perturbations of brief period on the other.

There is, however, this difference, that in the planetary theory all these varieties of effect have been satisfactorily traced up to a single cause, whereas in that of terrestrial magnetism this is so far from being demonstrably the case, that the contrary is not destitute of considerable probability. In fact, the great features of the magnetic curves, and their general displacements and changes of form over the whole surface of the earth, would seem to be the result of causes acting in the interior of the earth, and pervading its whole mass; while the annual and diurnal variations of the needle, with their train of subordinate periodical movements, may, and very probably do arise from, and correspond to electric currents produced by periodical variations of temperature at its surface, due to the sun's position above the horizon, or in the ecliptic, modified by local causes; while local or temporary electric discharges, due to thermic, chemical, or mechanical causes, acting in the higher regions of the atmosphere, and relieving themselves irregularly or at intervals, may serve to render account of those unceasing, and as they seem to us casual movements, which recent observations have placed in so conspicuous and interesting a light. The electrodynamic theory, which refers all magnetism to electric currents, is silent as to the causes of those currents, which may be various, and which only the analysis of their effects can teach us to regard as internal, superficial, or atmospheric.

It is not merely for the use of the navigator that charts, giving a general view of the lines of Magnetic Declination, Inclination, and Intensity, are necessary. Such charts, could they really be depended on, and were they in any degree complete, would be of the most eminent use to the theoretical inquirer, not only as general directions in the choice of empirical formulæ, but as powerful instruments for facilitating numerical investigation, by the choice they afford of data favourably arranged; and above all, as affording decidedly the best means of comparing any given theory with observation. In fact, upon the whole, the readiest, and beyond comparison the fairest and most effectual mode of testing the numerical applicability of a theory of terrestrial magnetism, would be, not servilely to calculate its results for given localities, however numerous, and thereby load

* This request was conveyed in a letter from Sir John Barrow, addressed to the Secretary of the Royal Society, and dated June 13, 1839.

its apparent errors with the real errors, both of observation and of local magnetism; but to compare the totality of the lines in our charts with the corresponding lines, as they result from the formulæ to be tested, when their general agreement or disagreement will not only show how far the latter truly represent the facts, but will furnish distinct indications of the modifications they require.

Unfortunately for the progress of our theories, however, we are yet very far from possessing charts even of that one element, the Declination, most useful to the navigator, which satisfy these requisites; while as respects the others (the Inclination and Intensity) the most lamentable deficiencies occur, especially in the Antarctic regions. To make good these deficiencies by the continual practice of every mode of observation appropriate to the circumstances in which the observer is placed throughout the voyage, will be one of the great objects to which attention must be directed. And first—

At sea.—We are not to expect from magnetic observations made at sea the precision of which they are susceptible on land. Nevertheless, it has been ascertained that not only the Declination, but the Inclination and Intensity can be observed, in moderate circumstances of weather and sea, with sufficient correctness, to afford most useful and valuable information, if patience be bestowed, and proper precautions adopted. The total intensity, it is ascertained, can be measured with some considerable degree of certainty by the adoption of a statical method of observation recently devised by Mr. Fox, whose instrument will be a part of the apparatus provided. And when it is recollected that but for such observations the whole of that portion of the globe which is covered by the ocean must remain for ever a blank in our charts, it will be needless further to insist on the necessity of making a daily series of magnetic observations, in all the three particulars above mentioned, whenever weather and sea will permit, an essential feature in the business of the voyage, in both ships. Magnetic observations at sea will, of course, be affected by the ship's magnetism, and this must be eliminated to obtain results of any service. To this end,

First. Every series of observations made on board should be accompanied with a notice of the direction by compass of the ship's head at the time.

Secondly. Previous to sailing, a very careful series of the apparent deviations, as shown by two compasses permanently fixed, (the one as usual, the other in a convenient position, considerably more forward in the ship,) in every position of the ship's head, as compared with the real position of the ship, should be made and recorded, with a view to attempt procuring the constants of the ship's action according to M. Poisson's theory*; and this process should be repeated on one or more convenient occasions during the voyage; and, generally, while at anchor, every opportunity should be taken of swinging round the ship's head to the four cardinal points, and executing in each position a complete series of the usual observations.

Thirdly. Wherever magnetic instruments are landed, and observations made on *terra firma*, or on ice, the opportunity should be seized of going through the regular series on ship-board with more than usual diligence and care, so as to establish by actual experiment in the only unexceptionable manner the nature and amount of the corrections due to the ship's action for that particular geographical position, and by the assemblage of all such observations to afford data for concluding them in general.

Fourthly. No change possible to be avoided should be made in the disposition of considerable masses of iron in the ships during the whole voyage; but if such change be necessary, it should be noted.

Fifthly. When crossing the magnetic line of no dip it would be desirable to go through the observation for the dip with the instrument successively placed in a series of different magnetic azimuths, by which the influence of the ship's magnetism in a vertical direction will be placed in evidence.

On land, or on ice.—As the completeness and excellence of the instruments with which the expedition will be furnished will authorize the utmost confidence in the results obtained by Captain Ross's well known scrupulosity and exactness in their use, the redetermination of the magnetic elements at points where they are already considered as ascertained, will be scarcely less desirable than their original determination at stations where they have never before been observed. This is the more to be insisted on, as lapse of time changes these elements in some cases with considerable rapidity; and it is therefore of great consequence that observations to be compared should be as nearly contemporary as possible, and that data should be obtained for eliminating the effects of secular variations during short intervals of time, so as to enable us to reduce the observations of a series to a common epoch.

On the other hand it cannot be too strongly recommended, studiously to seek every opportunity of landing on points (magnetically speaking) unknown, and determining the elements of those points with all possible precision. Nor should it be neglected, whenever the slightest room for doubt subsists, to determine at the same time the geographical position of the stations of observation in latitude and longitude. When the observations are made on ice, it is needless to remark that this will be universally necessary.

With this general recommendation it will be unnecessary to enumerate particular localities. In fact, it is impossible to accumulate too many. Nor can it be doubted that in the course of antarctic exploration, many hitherto undiscovered points of land will be encountered, each of which will, of course, become available as a magnetic station, according to its accessibility and convenience.

There are certain points in the regions about to be traversed in this voyage, which offer great and especial interest in a magnetic point of view. These are, first, the south magnetic pole (or poles), intending thereby the point or points in which the horizontal intensity vanishes and the needle tends vertically downwards; and secondly, the points of maximum intensity, which, to prevent the confusion arising from a double use of the word poles, we may provisionally term magnetic *foci*.

It is not to be supposed that Captain Ross, having already signalized himself by attaining the northern magnetic pole, should require any exhortation to induce him to use his endeavours to reach the southern. On the contrary, it might better become us to suggest for his consideration, that no scientific datum of this description, nor any attempt to attain very high southern latitudes, can be deemed important enough to be made a ground for exposing to *extraordinary* risk the lives of brave and valuable men. The magnetic pole, though not attained, will yet be pointed to by distinct and unequivocal indications; viz. by the approximation of the dip to 90°; and by the convergence of the magnetic meridians on all sides towards it. If such convergence be observed over any considerable region, the place of the pole may thence be deduced, though its locality may be inaccessible.

M. Gauss, from theoretical considerations, has recently assigned a probable position in long. 146° E., lat. 66° S. to the southern magnetic pole, denying the existence of two poles of the same name, in either hemisphere, which, as he justly remarks, would entail the necessity of admitting also a third point, having some of the chief characters of such a pole intermediate between them. That this is so may be made obvious without following out his somewhat intricate demonstration, by simply considering, that if a needle be transported from one such pole to another of the same name, it will *begin* to deviate from perpendicularity *towards* the pole it has quitted, and will end in attaining perpendicularity again, after pointing in the latter part of its progress obliquely *towards the pole to which it is moving*, a sequence of things impossible without an intermediate passage through the perpendicular direction.

It is not improbable that the point indicated by M. Gauss will prove accessible; at all events, it cannot but be approachable sufficiently near to test by the convergence of meridians the truth of the indication. And as his theory gives within very moderate limits of error the true place of the northern pole, and otherwise represents the magnetic elements in every explored region with considerable approximation, it is but reasonable to recommend this as a distinct point to be decided in Capt. Ross's voyages. Should the decision be in the negative, i. e. should none of the indications characterizing the near vicinity of the magnetic pole occur in that region, it will be to be sought; and a knowledge of its real locality will be one of the distinct scientific results which may be confidently hoped from this expedition, and which can only be attained by circumnavigating the antarctic pole compass in hand.

The actual attainment of a *focus* of maximum intensity is rendered difficult by the want of some distinct character by which it can be known, previous to trial, in which direction to proceed, when after increasing to a certain point the intensity begins again to diminish. The best rule to be given would be (supposing circumstances would permit it) on perceiving the intensity to have become nearly stationary in its amount, to turn short and pursue a course at right angles to that just before followed, when a change could not fail to occur, and indicate by its direction towards which side the focus in question were situated.

Another, and as it would appear, a better mode of conducting such a research would be, when in the presumed neighbourhood of a focus of maximum intensity, to run down two parallels of latitude or two arcs of meridians separated by an interval of moderate extent, observing all the way in each, by which observations, when compared, the concavities of the isodynamic lines would become apparent, and perpendiculars to the chords, intersecting in or near the foci, might be drawn.

Two foci or points of maximum *total* intensity are indicated by the general course of the lines in Major Sabine's chart in the Southern Hemisphere, one about long. 140° E., lat. 47° S., the other more obscurely in long. 235° E., lat. 60° S., or thereabouts. Both these points are certainly accessible, and as the course of the expedition will lead not far from each of them, they might be visited with advantage by a course calculated to lead directly across the isodynamic ovals surrounding them.

Pursuing the course of the isodynamic lines in the chart above mentioned, it appears that one of the two points of *minimum* total intensity, which must exist, if that chart be correct, may be looked for nearly about lat. 25° S., long. 12° W., and that the intensity at that point is probably the least which occurs over the whole globe. Now this point does not lie much out of the direct course usually pursued by vessels going to the Cape. It would therefore appear desirable to pass directly over it, were it only for the sake of determining by direct measure the least magnetic intensity at present existing on the earth, an element not unlikely to prove of importance in the further progress of theoretical investigation. Excellent opportunities will be afforded for the investigation of all these points, and for making out the true form of the isodynamic ovals of the South Atlantic, both in beating up for St. Helena, and in the passage from thence to the Cape; in the course of which, the point of least intensity will, almost of necessity, have to be crossed, or at least approached very near.

Nor is the theoretical line indicated by Gauss as dividing the northern and southern regions, in which free magnetism may be regarded as superficially distributed, undeserving of attention. That line cuts the equator in 6° east longitude, being inclined thereto (supposing it a great circle) 15°, by which quantity it recedes from the equator northward in going towards the west of the point of intersection. Observations made at points lying in the course of this line may hereafter prove to possess a value not at present contemplated.

As a theoretical datum, the horizontal intensity has been recommended by Gauss, in preference to the total, not only as being concluded from observations susceptible of great precision, but as affording immediate facilities for calculation. As it cannot now be long before the desideratum of a chart of the horizontal intensity is supplied, the maxima and minima of this element may also deserve especial inquiry, and may be ascertained in the manner above pointed out.

The maxima of horizontal intensity are at present undetermined by any direct observation. They must of necessity, however, lie in lower magnetic latitudes than those of the total intensity, as its minima must in higher, and from such imperfect means as we have

* See Appendix A.

of judging, the conjectural situations of the maxima may be stated as occurring in

20° N.	80° E.	I.
7 N.	260 E.	II.
3 S.	130 E.	III.
10 S.	180 E.	IV.

Observations have been made of the horizontal intensity in the vicinities of II. and III., and are decidedly the highest which have been observed anywhere.

In general, in the choice of stations for determining the absolute values of the three magnetic elements, it should be borne in mind, that the value of each new station is directly proportional to its remoteness from those already known. Should any doubt arise, therefore, as to the greater or less eligibility of particular points, a reference to the existing magnetic maps and charts, by showing where the known points of observation are most sparingly distributed, will decide it.

For such magnetic determinations as those above contemplated, the instruments hitherto in ordinary use, with the addition of Mr. Fox's apparatus for the statical determination of the intensity, will suffice; the number of the sea observations compensating for their possible want of exactness. The determinations which belong to the second branch of our subject,—viz. those of the diurnal and other periodical variations, and of the momentary fluctuations of the magnetic forces,—require, in the present state of our knowledge, the use of those more refined instruments recently introduced. Being comparative rather than absolute, they depend in great measure (and as regards the momentary changes, wholly) on combined and simultaneous observation.

The variations to which the earth's magnetic force is subject, at a given place, may be classed under three heads, namely, 1. the *irregular* variations, or those which *apparently* observe no law; 2. the *periodical* variations, whose amount is a function of the *hour* of the day, or of the *season* of the year; and 3. the *secular* variations, which are either slowly progressive, or else return to their former values in periods of very great and unknown magnitude.

The recent discoveries connected with the *irregular* variations of the magnetic declination, have given to this class of changes a prominent interest. In the year 1818 M. Arago made, at the Observatory of Paris, a valuable and extensive series of observations on the declination changes; and M. Kupffer having about the same time undertaken a similar research at Cazan, a comparison of the results led to the discovery that the perturbations of the needle were *synchronous* at the two places, although these places differed from one another by more than forty-seven degrees of longitude. This seems to have been the first recognition of a phenomenon, which now, in the hands of Gauss and those who are labouring with him, appears likely to receive a full elucidation.

To pursue this phenomenon successfully, and to promote in other directions the theory of terrestrial magnetism, it was necessary to extend and vary the stations of observation, and to adopt at all a common plan. Such a system of simultaneous observations was organized by Von Humboldt in the year 1827. Magnetic stations were established at Berlin and Freyberg: and the Imperial Academy of Russia entering with zeal into the project, the chain of stations was carried over the whole of that colossal empire. Magnetic *houses* were erected at Petersburg and at Cazan; and magnetic instruments were placed, and regular observations commenced, at Moscow, at Sitka, at Nicolajeff in the Crimea, at Barnaoul and Nertschinsk in Siberia, and even at Pekin. The plan of observation was definitely organized in 1830; and simultaneous observations were made seven times in the year, at intervals of an hour for the space of forty-four hours.

In 1834 the illustrious Gauss turned his attention to the subject of terrestrial magnetism; and having contrived instruments which were capable of yielding results of an accuracy before unthought of in magnetic researches, he proceeded to inquire into the simultaneous movements of the horizontal needle at distant places. At the very outset of his inquiry he discovered the fact, that the synchronism of the perturbations was not confined (as had been hitherto imagined) to the larger and extraordinary changes; but that even the minutest deviation at one place of observation had its counterpart at the other. Gauss was thus led to organize a plan of simultaneous observations not at intervals of an hour, but at the short intervals of five minutes. These were carried on through twenty-four hours six* times in the year; and magnetic stations taking part in the system were established at Altona, Augsburg, Berlin, Bonn, Brunswick, Breda, Breslau, Cassel, Copenhagen, Dublin, Freyberg, Göttingen, Greenwich, Halle, Kazan, Cracow, Leipsic, Milan, Marburg, Munich, Naples, St. Petersburg, and Upsala.

Extensive as this plan appears, there is much yet remaining to be accomplished. The stations, numerous as they are, embrace but a small portion of the earth's surface; and what is of yet more importance, none of them are situated in the neighbourhood of those *singular points* or curves on the earth's surface, where the *magnitude* of the changes may be expected to be excessive, and perhaps even their *direction* inverted. In short, a wider system of observation is required to determine whether the amount of the changes (which is found to be very different in different places) is dependent simply on the *geographical* or on the *magnetical* co-ordinates of the place; whether, in fact, the variation in that amount be due to the greater or less distance of a disturbing centre, or to the modifying effect of the mean magnetic force of the place, or to both causes acting conjointly. In another respect also, the plan of the simultaneous observations admits of a greater extension. Until lately the movements observed have been only those of the magnetic *declination*, although there can be no doubt that the *inclination* and the *intensity* are subject to similar perturbations. Recently, at many of the German stations, the *horizontal component* of the intensity has been observed, as well as the declination; but the determination of another element is yet required, before we are possessed of all the data necessary in this most interesting research.

The magnetic observations about to be established in the British Colonies, by the liberality of the Government, will (it is hoped) supply in a great measure these desiderata. The stations are widely scattered over the earth's surface, and are situated at points of prominent interest with regard to the Isodynamic and Isoclinal lines. The point of maximum intensity in the northern hemisphere is *in* Canada; the corresponding maximum in the southern hemisphere is *near* Van Diemen's Land; St. Helena is close to the line of *minimum intensity;* and the Cape of Good Hope is of importance on account of its southern latitude. At each observatory the changes of the *vertical component* of the magnetic force will be observed, as well as those of the *horizontal component* and *declination;* and the variations of the two components of the force being known, those of the *inclination* and of the *force* itself are readily deduced. The simultaneous observations of these three elements will be made at numerous and stated periods, and we have every reason to hope that the directors of the various European observatories will take part in the combined system.

But interesting as these phenomena are, they form but a small part of the proper business of an observatory. The *regular* changes (both periodic and secular) are no less important than the irregular; and they are certainly those by which a patient inductive inquirer would seek to ascend to general laws. Even the empirical expression of these laws cannot fail to be of the utmost value, as furnishing a correction to the absolute values of the magnetic elements, and thereby reducing them to their mean amount.

The hourly changes of the *declination* have been frequently and attentively observed; but with respect to the periodical variations of the other two elements, our information is as yet very scanty. The determination of these variations will form an important part of the duty of the magnetic observatories; and from the accuracy of which the observations are susceptible, and the extent which it is proposed to give them, there can be no doubt that a very exact knowledge of the empirical laws will be the result.

With respect to the *secular* variations, it might perhaps be doubted whether the limited time during which the observatories will be in operation is adequate to their determination. But it should be kept in mind that the monthly mean corresponding to each hour of observation will furnish a separate result; and that the number and accuracy of the results thus obtained may be such, as fully to compensate for the shortness of the interval through which they are followed. A beautiful example of such a result, deduced from three years' observation of the declination, is to be found in the first volume of Gauss's magnetical work, of which a translation is published in the fifth number of Taylor's Scientific Memoirs.

It remains to say a few words of the instrumental means which have been adopted for the attainment of these ends.

The magnetic instruments belonging to each observatory and in constant use, are, 1. a declination instrument; 2. a horizontal force magnetometer; 3. a vertical force magnetometer. These instruments are constructed after the plan adopted by Professor Lloyd in the Magnetic Observatory of Dublin. The magnet, in the two former, is a heavy bar, fifteen inches long, and upwards of a pound in weight. In the declination instrument the magnet rests in the magnetic meridian, being suspended by fibres of silk without torsion. In the horizontal force magnetometer, the magnet is supported by two parallel wires, and maintained in a position at right angles to the magnetic meridian by the torsion of their upper extremities. In both instruments the changes of position of the magnet are read off by means of an attached collimater having a divided scale in its focus. The magnetometer for the vertical force is a bar resting by knife edges on agate planes, and capable of motion therefore in the vertical plane only. This bar is loaded, so as to rest in the horizontal position in the mean state of the force; and the deviations from that position are read off by micrometers near the two extremities of the bar.

In addition to these instruments, each observatory is furnished with a dip circle, a transit with an azimuth circle, and two chronometers. Each vessel also is supplied with a similar equipment. Should therefore the ships be under the necessity of wintering in the ice,—and generally, on every occasion when the nature of the service may render it necessary to pass a considerable interval of time in any port or anchorage,—the magnetometers should be established, and observations made with all the regularity of one of the fixed observatories, and with strict attention to all the same details.

The selection of proper stations for the erection of the magnetometers, and the extent of time which can be bestowed upon each, must in a great measure depend on circumstances, which can only be appreciated after the expedition shall have sailed. The observatory at St. Helena (the officers and instruments for which will be landed by Captain Ross,) will in all probability,—and that at the Cape (similarly circumstanced in this respect) may possibly,—be in activity by the time the ships arrive at Kerguelen's Land; which we would recommend as a very interesting station for procuring a complete and as extensive a series of corresponding observations as the necessity of a speedy arrival at Van Diemen's Land for the establishment of the fixed observatory at that point will allow; taking into consideration the possibility of obtaining during the intermediate voyage, a similar series, at some point of the coast discovered by Kemp and Biscoe. In the ulterior prosecution of the voyage, a point of especial interest for the performance of similar observations will be found in New Zealand, which, according to the sketch of the voyage laid before us by Captain Ross, will probably be visited shortly after the establishment of the Van Diemen's Land observatory. The observations there will have especial interest, since, taken in conjunction with those simultaneously making in Van Diemen's Land, they will decide the important question, how far that exact correspondence of the momentary magnetic perturbations which has been observed in Europe, obtains in so remote a region, between places separated by a distance equal to that between the most widely distant European stations.

In the interval between quitting Van Diemen's Land and returning to it again, opportunities will no doubt occur of performing more than one other series of magnetometer observations, the locality of which may be conveniently left to the judgment of Captain Ross, bearing in mind the advantage of observing at

* Recently reduced to *four*.

stations as remote as possible from both Van Diemen's Land and New Zealand.

The research for the southern magnetic pole and the exploration of the antarctic seas will afford, it may be presumed, many opportunities of instituting on land hitherto unknown, or on firm ice when the vessel may be for a time blockaded, observations of this description; and in the progress of the circumnavigation, the line of coast observed or supposed to exist under the name of Graham's Land, or those of the islands in that vicinity, South Shetland, Sandwich Land, and finally on the homeward voyage the Island of Tristan d'Acunha, will afford stations each of its own particular interest.

A programme will be furnished of the days selected for simultaneous observations at the fixed observatories, and of the details to be attended to in the observations themselves as above alluded to. These days will include the *terms* or stated days of the German Magnetic Association, in which, by arrangements already existing, every European magnetic observatory is sure to be in full activity. These latter days, which occur four times in the year, will be especially interesting, as periods of magnetometrical observations by the expedition, when the circumstances of the voyage will permit. For the determination of the existence and progress of the diurnal oscillation, in so far as that important element can be ascertained in periods of brief duration, it will be necessary to continue the observations hourly during the twenty-four for not less than one complete week. At every station where the magnetometers are observed, the absolute values of the dip, horizontal direction, and intensity will require to be ascertained.

Sydney, for a station of absolute determinations, would be with great propriety selected, as there can be no doubt of its becoming at no distant period a centre of reference for every species of local determination.

The meteorological particulars to be chiefly attended to, as a part of the magnetic observations, are those of the barometer, thermometer, wind, and especially auroras, if any. In case of the occurrence of the latter indeed, the hourly should at once be exchanged for uninterrupted observation, should that not be actually in operation. The affections of the magnetometers during thunder-storms, if any, should be noticed, though it is at present believed that they have no influence.

During an earthquake in Siberia in 1829, the direction of the horizontal needle, carefully watched by M. Erman, was uninfluenced; should a similar opportunity occur, and circumstances permit, it should not be neglected.

Should land or secure ice be found in the neighbourhood of the magnetic pole, every attention will of course be paid to the procuring a complete and extensive series of magnetometric observations, which in such a locality would form one of the most remarkable results of the Expedition.

2. *Figure of the Earth.*—The Expedition being provided with invariable Pendulums, with all the necessary apparatus for determining the length of the seconds pendulum, it will be highly desirable to have this important observation made at several points, especially in high southern latitudes, and generally speaking at points as remote as possible from those at which it has already been determined. The selection of these must depend on local circumstances, as regards convenience for landing the instruments and executing the operations, as well as on the times of arrival at the several points.

It would also be desirable, if a convenient opportunity occurs, to swing the pendulums on the top of some high mountain; in which case they should also be swung at the foot of the same mountain, in order to determine the difference produced by the elevation, or other effect of the high land.

Another experiment which it would be desirable to make, is to swing the pendulum on a large field of fixed ice, as far from the land as possible; and likewise on the nearest shore to such position. In all these cases more than one pendulum should be used; and at least three knife edges should be employed, in order to guard against any unforeseen anomaly that may arise.

It is scarcely necessary to state, that the direction of the line of motion, with respect to the magnetic meridian, should be noted at each station.

3. *Tides.*—With regard to *tides*, it is not likely that Capt. Ross's other employments will allow him to pursue observations on that subject with any continuity; nor is it desirable that he should do so, excepting he were able to carry on his observations to a much greater extent than is consistent with the nature of the Expedition. There are, however, certain objects which may be answered by occasional and detached observations, which may be briefly stated.

1st. At all stations on the coasts visited, and especially at all detached islands in the middle of wide seas, it is desirable to obtain the *correct establishment* of the place, or mean lunitidal interval. This may be done with tolerable accuracy by a few observations of successive high waters; and these must be reduced with a proper allowance for the age of the moon; that is, not only for the time of the moon's transit, but also for the semimenstrual inequality. The things to be observed are, the *mean solar* time of high water, the rise of the tide from low to high water, and, if convenient, the *mean solar* time of low water.

2nd. It is desirable to ascertain the existence and amount of *the diurnal inequalities* in such situations as have been spoken of. For this purpose, the heights of high water should be observed for several successive tides, day and night; and, if possible, this should be done when the moon is at her greatest declination, or a few days later; at any rate, not when the moon is in the equator, nor a few days after that period.

It is very probable, that a diurnal inequality of the *heights* will be detected; but it appears not worth while to attempt, under the circumstances, to detect a diurnal inequality of the *times*.

4. *Meteorology.*—A complete meteorological register will of course be kept in each ship during the whole continuance of the voyage; skeleton forms for the arrangement of the observed and reduced quantities are furnished. These are adapted for intervals of observation of six hours throughout the twenty-four; and although hourly observations be made, as is undoubtedly to be desired, yet the regular entry and reduction of the observations for the hours in the skeleton forms is nevertheless essential, for the sake of future comparison with those similarly entered and reduced at the fixed stations. But in considering the suggestions which it may be proper to offer upon this branch of the subject, the Council have been induced to take a more comprehensive view than might at first be supposed to be called for by the immediate objects of the Expedition. So many references have lately been made to them upon the subject of directions for meteorological observations, that they have embraced the opportunity of proposing a plan of extensive co-operation, applicable alike to the Expedition, to the Magnetic Observatories about to be established, and to other Observatories for which directions have been thus solicited. The Council have therefore thought it more convenient to draw up a separate Report, which, as regards the Antarctic Expedition and the Magnetic Observatories, may be considered as supplementary to the present one.

In the way of general remark on this subject, we may observe, that it is impossible to pay too much attention to the zero points of the instruments, especially the barometer. Every thermometer and barometer, furnished both to the ships and for the observatories, will in the first instance have been carefully compared with those of the Royal Society; and one barometer in each ship should be continually referred to as a standard, whenever the instruments are landed and on their return on board, so as to detect and take account of any change which may have occurred in the interval; while the two standards, whenever the ships are in company, will become checks on each other through the medium of the register. Nor should the opportunity be lost of comparing these standard barometers (by the intervention of portable ones) with the standard barometer of the Cape Observatory, and with that used at Port Arthur, Van Diemen's Land, in the meteorological register kept by Sir J. Franklin's orders by Mr. Lempriere, as well as with the standard at the observatory at Paramatta, and with any other instrument likely to be referred to as a standard or employed in research elsewhere.

The general fact, that the barometer at the level of the sea does not indicate a mean atmospheric pressure of equal amount in all parts of the earth,—but, on the contrary, that the equatorial pressure is uniformly less in its mean amount than that at and beyond the tropics,—was first noticed by Von Humboldt, and has since been demonstrated by the assemblage of many observations made during voyages and on land by Schouw, as well as by other observations, an account of which will be found in the Reports of the Meteorological Committee of the South African Philosophical Society for 1836 and 1837. This inequality of mean pressure is a meteorological phenomenon of the greatest and most universal influence, as it is, in fact, no other than a *direct measure of the moving force*, by which the great currents of the trade-winds are produced; so that the measure of its amount, and the laws of its geographical distribution, lie at the root of the theory of these winds. The progress of barometric depression on approaching the line, and re-ascension in receding from it, will therefore be watched with interest proportionate to its intrinsic importance during the voyage outwards and homewards.

But it may very well happen that phenomena purely local, of the same nature, may exist, not as *cause*, but as *effect*; in other words, that the regular currents once established may, in particular localities, determined by the configuration of continents and by the influence of oceanic currents, or other causes, form permanent eddies or atmospheric ripples, so to speak, under which the mean pressure may deviate materially from the general average. An instance of permanent barometric depression of this kind, in the neighbourhood of the sea of Ochotzk, is mentioned by Erman; and a second seems to be pointed out in the neighbourhood of Cape Horn, by some remarks stated to have originated with Capt. Foster; and it is not impossible that something of the same kind, but of an inverse character, may be found to obtain in that remarkable district of Siberia mentioned by Erman, where during winter clouds are unknown, and snow never falls; and it is somewhat curious to notice, that the localities in question are not far from antipodes to each other.

In the outward and homeward passages of the Expedition across the equator (especially should the ships be delayed by calms), opportunity will be presented of determining the amount of diurnal barometric fluctuation, apart from the interfering influence of land and sea breezes, or their equivalents far inland, which in all land observations encumber and disturb this somewhat obscure phenomenon; as well as for ascertaining, also apart from those influences, the existence or non-existence of that difference between the diurnal and nocturnal maxima and minima, which has been proved to exist in some localities, and surmised to be general.*

Connected with the equatorial barometric depression, and the ascensional current of heated air which produces that depression, is a phenomenon which may serve to elucidate the mechanism of this current in its origin, as well as to illustrate the mode in which ascending currents occasionally produce rain. It cannot be supposed that the whole body of the equatorial atmosphere rises *en masse*, or with any regularity or steadiness. Such a movement would be out of analogy with what we know of the movements of fluids in general. Its *tendency* to rise is general, but this tendency is diverted by a thousand local influences, and concentrated on particular points, where it results in ascending columns and sheets, between which wind-flaws, capricious in their direction and intensity, and often amounting to sharp squalls, mark out the course of their feeders and of the indraft of cooler air from a distance to supply their void. Now, the existence of such ascending columns is rendered frequently visible in a very unequivocal way, by vast piled-up masses of cloud of that peculiar form which has been called cumulo-stratus, the bottom being flat and ill-defined, the upper parts towering to an immense height, and ragged with great protuberances. From the bases of these great cumular piles are almost constantly seen to descend those violent showers so common in the calm latitudes.

It would be interesting on many accounts to obtain *measures*, even if somewhat vague, of the altitudes at

* See Reports of Met. Com. S. A. Phil. Soc. above referred to.

which the *bases* of these clouds rest, as well as of the height of their summits, and to measure the temperature of the rain which falls from them at successive periods, as they pass over the ship, so as to ascertain whether the rain which falls along their axis be not colder (from coming, at least in part, from a greater elevation) than that from their skirts. The vapour plane, in such circumstances being nearly or precisely uniform over vast tracts of sea, the altitude of the base of such cloud vertically overhead may be considered the same as that of any other favourably situated for measure. In fact, the determination of the *mean height of the vapour plane* at and near the equator is one of high meteorological import, and is connected by no circuitous steps with all the most interesting questions regarding the distribution of aqueous vapour over the globe, and the irrigation of the continents.

5. *Distribution of temperature in the sea and land.*—Connected as this subject is with meteorology, it requires in some points of view to be considered apart. As the currents in the atmosphere are produced by the difference of temperature in its polar and equatorial regions, so it may be contended are those of the ocean by differences of temperature due to the same geographical causes. Such is the view taken by M. Arago in his elaborate instructions for the voyage of the *Bonite*, and it would appear undoubtedly more just than that which attributes them *wholly* to the friction and pressure of the winds. Nevertheless, it must not be forgotten that there is an essential difference in the modes of action in the two cases. The sun's heat is effective in heating the air mainly *from below*, where it is in contact with the earth or water which absorb the rays, and communicate them to the air above. In the sea, the case is otherwise. The sun's rays are totally absorbed at the surface, and no ray reaches the bottom of any sea deserving the name. No deep stratum of water, therefore, can be permanently maintained by the sun's *direct* heat at a temperature greatly above what it would have independently of its direct action. Hence the motive power in a system of currents so originating must be sought, not in the *ascensional* force at the equator, but in a *descensional* one in the polar regions, or rather in that one polar region in which winter prevails. The order of the phenomena then is precisely the reverse of what obtains in the atmosphere; moreover, the seat of the efficient agency is not only much less extensive than in the case of the atmospheric currents, but also subject to a semiannual shifting from one to the other extremity of the earth's axis, both which causes must tend greatly to diminish the average energy of the effect.

Practically speaking, the question resolves itself into one of fact, which observation only can decide. Is there, in the whole column of water between the surface of the ocean and its bed at the poles, as compared with a column of equal depth at the equator, and *in free communication with it*, a descensional power or not? and what is its amount? These questions can only be resolved by observations of the temperature and saltness of the sea, at various and considerable depths, in different latitudes, and under a great variety of local circumstances. The procuring such observations, and the preservation of specimens of the water, or the determination on the spot of their specific gravities, will afford a useful occupation in calms, and may be recommended as well worthy of attention. Theoretically speaking, the subject is more complicated than at first appears, since it cannot but be that some considerable portion of solar heat absorbed by the equatorial continents,—in place of finding its way out of the earth by radiation at the poles, in the mode of subterraneous communication suggested by Fourrier,—must escape through the bed of the ocean into its waters, and so be carried into their circulation.

Opportunities for determining the temperature of the ocean at great depths must of course be rare; but at moderate depths it can always be done with comparatively little trouble, and we would, therefore, suggest the propriety of making observations of this element at two moderate and constant depths (say 150 and 300 fathoms), by the aid of a self-registering thermometer attached to a sounding line, whenever the ship's way shall be such as to allow their being made with precision.

6. *Currents of the Ocean.*—These are either subaqueous or superficial, and, like those in the atmosphere, both may co-exist at the same place, with different directions and velocities. Of the former, we know almost nothing, and of the latter but little, compared with what would be desirable and most useful. The practice of daily throwing overboard a bottle corked and sealed with the latitude and longitude of the ship at noon ought not to be neglected. A single instance of such a record being found may suffice to afford indications of the utmost value, while the trouble and cost are too trifling to mention.

As no sea can be supposed absolutely motionless, the presence of a shoal, by casting up at the surface water which, but for it, would have continued to sweep along at a greatly lower level with the general body of the current, must bring the temperature of the surface water into nearer correspondence with that below. In low latitudes, the surface water is hotter than that below, and accordingly it is a general remark, that the temperature sinks as the water shoals, or even in passing over banks whose depth is very considerable. If this theory of the phenomenon be correct, the contrary ought to be observed in situations where the surface water is colder than that below, as it is known to be under particular circumstances in the Polar Seas. In still larger tracts in high latitudes, the seas have nearly a uniform temperature throughout their whole depth. In such circumstances, should any superficial variation of temperature be observed, in passing over a shoal or bank, it could only be ascribed to radiation. The subject is one of considerable interest to the navigator, as the approach to land or to shoal water is indicated by the thermometer with a high degree of sensibility. We have before us recent observations of this kind, the one at entering Table Bay in 1834, the other at quitting it in the present year. In the former case, the temperature fell 9° Fahr. in passing from deep water into the Bay; in the latter, under reverse circumstances, a rise of no less than 13° Fahr. was experienced, the temperature of the air remaining unaltered. The last-mentioned observations being very remarkable, the particulars are annexed:—

Memorandum of observations made on board the Earl of Hardwicke, H.E.I.C.S. by Captain Henning.

March 17th, 1839. Temperature of air at 5h P.M., four miles from Cape Town ..... 64°·0
Of Sea..... 52°·0
5h 30m One mile north of Robben Island. Air 64°·0
Sea ..... 57°·0
March 18th at sea. Air..... 64°·0
Sea ..... 65°·0

The opportunity of re-examining this point, and in general, of investigating more closely the phenomena of temperature in the neighbourhood of the Lagullas Bank will, of course, not be lost sight of as the ships approach to and leave the Cape.

The distribution of temperature over the globe must greatly depend on the intensity which the solar rays possess on attaining the surface of the earth after traversing the atmosphere in different latitudes. To subject this point to direct inquiry in a mode which, after many years trial, has been found to give very satisfactory results, Actinometers are provided, and accompanied with very precise directions for their use. They should be observed only when the sky in the immediate neighbourhood of the sun is perfectly free from visible cloud. On the other hand, depression of temperature caused by diurnal and nocturnal radiation by the only means we at present possess for that purpose,—viz. that of thermometers blackened and exposed in reflectors to the sky,—will form a useful and valuable supplement to the actinometric researches. With a view to the collection of facts illustrative of the distribution of temperature on land, wherever the ships may touch with a prospect of remaining some days, no time should be lost, on landing, in burying in the earth one or more bottles (filled with spirits, if there should be danger of water freezing), well packed in cases, or boxes stuffed with non-conducting matter, such as woollen cloth, pounded charcoal, &c., but so as to leave easy access to the neck, which should be wide enough to introduce the bulb and stem of a good thermometer, so as to take the temperature of the contained liquid rapidly, before it can have become altered by exposure in the air on taking up the bottle. Bottles so arranged should be buried at depths of three, six, nine, twelve, &c. feet,* according to the facilities of penetrating the soil, and abandoned till the time of departure, so as to insure their acquiring the precise temperature of the soil; and when taken up, should immediately have the temperature of the included liquids ascertained. In case of very prolonged sojourn, monthly readings should be taken. The temperatures of all springs and wells should also be diligently noted and registered.

Connected with the transcalescence of the air, is the transparency of the sea. The stimulus of the solar light no doubt affects the surface of mollusca at great depths, and numerous points of physical inquiry would be elucidated if we knew the co-efficients of extinction of the solar rays by pure sea water. As far as the luminous rays are concerned (or at least the chemical), the actual intensity of these rays at various depths might be very easily ascertained, both for direct sunshine and that of cloudy daylight, by the aid of Mr. Talbot's sensitive paper; which, duly guarded from wet by varnish and interposition between glass plates, might be sunk, face upwards in a small frame, while a portion of the same paper, cut from the same sheet, should be similarly exposed on deck, and partially shaded, inch by inch, from minute to minute (or for a smaller interval, according to the sensitiveness of the paper), with a view to immediate comparison, between decks by a light not strong enough to alter the tint.

A simple and convenient mode of photometric measurement is also furnished by the sensitive paper above alluded to, by the exposure of a small portion of it to the sun at noon for a given time, suppose ten seconds, and subsequent comparison with a scale of tints. Paper duly prepared for these purposes will be supplied for the use of the expedition. During solar eclipses, such paper ought to be exposed at intervals of five minutes.

The temperature of the soil under the direct influence of the sun as indicated by a thermometer barely covered with dry earth, is an element of importance to the botanist, and may be recommended as an apt accompaniment to actinometric observations. The thermometer used should have a scale reading at least to 180° Fahr.

The height of the line of perpetual snow, by whatever indications marked, should also be ascertained, wherever practicable.

7. *Depth of the Sea.*—Soundings to as great a depth as practicable should be taken wherever opportunities may offer. Great difficulty, however, is well known to exist in the way of procuring any exact result, or indeed any result at all in very deep seas: and various methods (all objectionable) have been proposed and tried. Could any means be provided to keep out the water from the shell, and at the same time ensure its explosion on striking the bottom, the time elapsed, between casting the shell overboard and hearing the explosion, would indicate the depth with great precision; nor need we fear that, if the explosion took place, the sound would not be heard, sound being propagated through water with infinitely greater sharpness and clearness than through air. To overcome the enormous external pressure, and to enable the charge to burst the shell, it is probable that mere gunpowder might not suffice. Should this be apprehended, a mixture of fulminating mercury, with the charge in about equal proportions, would probably effect the object. At least, we know, from experience, the vast increase of bursting power which is communicated to powder by such addition. It has also been suggested, that an *echo* from the bed of the ocean might be heard, were a shell exploded just beneath the surface (as an echo from the earth is heard in the car of a balloon); and attempts, though imperfect ones, have been made to subject this proposal to trial, the reason of the failure of which does not very distinctly appear. The maximum depth of the sea is a geological datum of such value, that a few failures incurred in attempts may very well be tolerated when placed in competition with the interest of even partial success.

8. *Atmospherical Phenomena.*—There can be little need to call the attention of navigators to anything relating to winds, storms, lightning, &c.; yet there are some points to which attention may be expressly drawn, viz. to such distribution and movements of

* These are the depths adopted in Mr. Forbes's recent experiments.

the clouds as indicate the existence at the same time of an upper and under current of wind moving in opposed or differing directions. In such cases, the sun, moon, or a star should be taken as a point to fix the eye. In storms, the barometer should be very assiduously noted in relation to the varying phases of the gale and the changes of wind, and particularly to those sudden shifts of wind which characterize revolving storms. The Council are not aware that the state of the barometer during "a white squall" has ever been very carefully noted from instant to instant; or that it, or the more sensitive sympiesometer, have been referred to during the approach and recess of a waterspout.

The phenomena of ordinary thunder-storms may be thought to afford little matter for remark, and extraordinary ones will be noted of course. Yet there is one point to which we should wish that some attention might be paid,—it is the sudden gush of rain which is almost sure to succeed a violent detonation immediately overhead. Is this rain a *cause* or a *consequence* of the electric discharge? Opinion would seem to lean to the latter side, or rather, we are not aware that the former has been maintained or even suggested. Yet it is very defensible. In the sudden agglomeration of many minute and feebly electrified globules into one rain drop, the quantity of electricity is increased in a greater proportion than the surface over which (according to the laws of electric distribution) it is spread. Its tension therefore is increased, and may attain the point when it is capable of separating from the *drop* to seek the surface of the *cloud*, or of the newly-formed descending body of rain, which, under such circumstances, and with respect to electricity of such a tension, may be regarded as a conducting medium. Arrived at this surface, the tension for the same reason becomes enormous, and a flash escapes.

The following points should be observed, with a view to this mode of regarding the formation of lightning. 1st. The actual electric state of *that* rain which follows suddenly after a discharge originating vertically overhead.

2nd. Does lightning ever happen without rain *in the immediate point where it originates*, or at least without a rapid formation and increase of cloud at that point?

3rd. Does it ever lighten from a cloud undergoing actual diminution from evaporation?

4th. Do the cumular clouds, already noticed as continually forming and raining in the calm latitudes, usually or frequently send forth flashes of lightning; and if so, under what conditions, and with what effects?

Observations of Aurora will form a highly interesting subject, should the Expedition be under the necessity of wintering, or of passing any of the later part of the season in south latitudes admitting of their exhibition. Their effects on the magnetic needle will of course be narrowly watched; but all their phenomena should be minutely registered, such as the formation, colour, extent, situation, movement, and disappearance of arches, patches, banks, and streamers. In particular, we would draw attention to an appearance which sometimes occurs, and which cannot but be regarded as highly instructive. It consists in *pulsations* propagated with more or less swiftness through *patches* of sky *of definite forms*, which however become visible only in successive portions, as the pulse traverses them, giving the idea of masses of vaporous matter not visible *per se*, but rendered fitfully so, either by a band of light cast in succession over every part of them from without, or by a temporary phosphorescence developed within their substance when traversed by electric matter. Such pulsations as above described formed very remarkable features of the auroras of October 12, 1833, and of January 18, 1839.

Any indication of the *near vicinity* of auroral phenomena, or of their existence at a level below that of ordinary clouds, should be most minutely investigated at the moment, and carefully and circumstantially recorded.

On the nights from the 11th to the 14th of November the sky should be watched for the periodical meteors, whose existence seems now to be placed out of doubt; as also from the 9th to the 13th of August; and in general, any remarkable display of shooting stars should be noted. The zodiacal light also should be observed in clear nights, with a view to the better defining its limits, and ascertaining if it be really, as some have supposed, variable in its extent or lustre. Remarkable halos, parhelia, and other atmospheric phenomena, should be recorded, and careful measures of their dimensions taken with sextants or other instruments.

9. *Variable Stars.*—During night-watches in clear weather, in southern regions, many interesting observations might undoubtedly be made by any one acquainted with the constellations, or provided with a celestial map, as to the comparative lustre and variability of stars. Especially we would point out to the attention of such an observer the stars α Hydræ et Crateri as certainly, and δ Orionis as probably, variable; the former at its greatest brightness being equal to ϵ Argûs, and at its least equal or somewhat inferior to δ Argûs, which are the best stars for comparison with it. Its period of change, however, being only very imperfectly known, additional observations would be valuable. The remarkable star η Argûs should also be compared with others of the same apparent brightness, or nearly so, with a view to continue the history of its late extraordinary change of lustre. And we would earnestly recommend to any one who may undertake such observations, to form a list of a certain moderate number of stars, graduating from the first magnitude downwards by almost insensible steps, and having rendered himself familiar with them, to note their arrangement in order of brightness,—not once only, but on a great many nights, forming on each occasion separate independent judgments; trusting on no account to any printed catalogue, and diligently recording and preserving his memoranda. Such observations are not part of the ordinary business of astronomical observations, and are therefore neglected and abandoned to the amateur, the traveller, or the seaman in his night-watches, which they will be found to beguile of much of their tedium, and to reward by the frequent detection of variable stars not previously recognized as such.

10. *Refraction.*—The determination of refractions near the horizon, both of celestial and terrestrial objects in high southern latitudes, will form a very interesting subject of study. They may be pursued in various modes, of which perhaps the easiest is to note the disappearance of particular stars behind the horizontal edge of a board, erected at some considerable distance from a fixed point of observation, and then to ascertain, with all precision, the altitude of the line of disappearance, accompanying such observation with the height of the barometer and thermometer. Vertical diameters of the sun or moon, when very near the horizon, with the corresponding altitudes, will also be of use, as well as measurements of the distances of two considerable stars on the same vertical, and direct measures of the altitudes of one and the same star in the progress of its diurnal course when near the horizon. The curve of terrestrial refraction might also be actually traced out by a levelling-staff. Any cases of unusual refraction, mirage, reduplication and inversion of images, and of lateral refraction, should be recorded.

11. *Eclipses.*—In annular or total solar eclipses the optical circumstances attending the formation and rupture of the ring should be minutely attended to, as well as the defalcation of light and heat, to be measured by their appropriate methods, as detailed in the Meteorological instructions.

The solar eclipses of January 11, 1842, June 27, 1843, may possibly be central, or very large in some part of the progress of the expedition. In lunar *total eclipses* the occultations of stars, whether large or small, should be looked for, and any apparent projection on the disc noticed. Great attention should also be paid to the intensity, colour, and distribution of illumination over the disc during the *total* eclipse, as indicative of the general state of *the earth's* atmosphere in that great circle of the globe which at the moment is at right angles to the visual ray.

As a summary of this Report, the Council recommend to the Admiralty, to give instructions for the making and recording of the following observations, experiments, and researches.

1. Magnetic observations of the inclination, declination, and intensity at sea, throughout the voyage, daily in both ships, whenever the motion of the vessel will permit.

2. Precise determinations of the same particulars wherever the expedition may land, or disembark on ice.

3. Most careful series of magnetometric observations, in correspondence with those to be made at the fixed observatories, according to a plan concerted with the officers of those observatories, and with Professor Lloyd, the particulars of which will be furnished to each party concerned, and distributed to all the European and other observatories.

4. A circumnavigation of the Antarctic Pole, with a view to affording opportunities and proper stations for magnetic and other observations.

5. An inquiry into the actual position of the southern magnetic pole or poles, and the points or foci of greatest and least total and horizontal intensity, and into the course and figure of the isodynamic ovals presumed to occupy the area of the South Atlantic.

6. The determination of the length of the invariable pendulum at several stations in high south latitudes.

7. Observations of the tides, i. e. of the heights and times of high water, made at such stations at which the ships may remain long enough, and at which the correct establishment is unknown.

8. The keeping of a regular meteorological register in both ships during the whole voyage, and the paying attention to the phenomena of solar and terrestrial radiation, and generally to all phenomena bearing on the subject of meteorology.

9. The temperature of the sea at the surface and at stated moderate depths should be observed as frequently as possible, and whenever opportunity may occur, also, at the greatest depths attainable; and attention should be directed to the temperature of currents and shoals, as well as to its variation on approaching land. The temperature of the soil at various depths should be taken on landing, as well as that of springs, wells, &c.

10. Soundings should be attempted in deep seas, and specimens of the water brought up be preserved for future examination.

11. Observations should be collected of the aurora in high south latitudes; and attention directed to meteors and shooting stars on those occasions when experience has shown that they occur periodically in great abundance; as well as to the appearance of the zodiacal light, and other phenomena of a similar occasional nature.

12. Observations of the comparative brightness of southern stars should be procured, and especially of the variable stars α Hydræ and η Argûs.

13. The amount and laws of horizontal refraction, both celestial and terrestrial, in high south latitudes, should be investigated.

14. The phenomena of eclipses should be attended to.

Section II.—GEOLOGY AND MINERALOGY.

The primary object of the expedition being Magnetical Research,—and the officers by whom geological information is to be collected having various other and important duties to discharge, it is not so necessary to enter into detail with respect to inquiries in Geology and Mineralogy as if the expedition had been intended for more general purposes, with the probability of more time being at its disposal for these inquiries than its immediate objects will allow. A reference to published instructions for collecting and preserving specimens of minerals and fossils;—the indication of some general phenomena which may be deserving of attention in the Antarctic regions;—and the suggestion of some points of inquiry connected with the places at which the ships are expected to touch, will comprise all that need here be stated.

Collection of Specimens.—Under this head full directions are detailed in several publications, most of which are already in possession of Captain Ross or of his officers. †

† 1. 'Instructions for the collection of Geological Specimens,' printed and circulated by the Geological Society, 1830. 2. Instructions for the same object, distributed by Professor Buckland. 3. Directions for collecting Geological Specimens, by Dr. Fitton, subjoined to Captain P. P. King's Voyages on the coast of Australia. The Council would suggest, as also deserving of attentive perusal, the concluding pages in Mr. Darwin's Journal of his Voyage in the *Beagle*; and M. Cordier's Geological Instructions for the voyage round the world of *l'Astrolabe* and *La Zélée*; (*Comptes Rendus*, July to December 1837, p. 150 to 155); and for the voyage round the world of the *La Bonite*; (*Comptes*

1. Miscellaneous Suggestions.

Rocks and Minerals.—It is now an admitted principle, that collectors should avoid *rarities*. A good geological collection ought to represent faithfully the tract whence it has been formed. The greater number of the specimens, therefore, should consist of substances of the most common occurrence.

All local information bearing upon geology, though at the time it may appear unimportant, should be recorded.

Specimens ought to be taken from different parts of rock masses. They should exhibit the varieties of mineralogical character, as of lustre, fracture, &c.

Every rock specimen should exhibit one weathered surface.

If a rock be composed of different substances, specimens of each should be taken.

Specimens tinged with colours, green, blue, &c., should be taken, as indicating the presence of metals.

Specimens of crystals are frequent in cavities; they should be sought for, and packed with care.

Specimens should be dried, before packing finally.

Every specimen should be numbered as soon as possible.

Duplicate lists should be made, one of which should be placed in the box containing the specimens.

For packing crystallized minerals, chip-boxes are advantageous. The specimens should be fixed in their boxes, as firmly as may be, without crushing.

In some cases very large specimens only can fairly exhibit the appearances;—as where the surface is polished, scored, or worn, or impressed with ripple-mark, &c.

The sands of rivers and of coast are frequently the depositories of gold or other metals, platina, tin, &c.,—or of precious stones. They should be well examined, and sometimes washed; as should also the alluvial detritus found in valleys, or beneath the surface of level plains.

Specimens of Fossils—should always be accompanied with part of the rock in which they occur, whether stone, clay, or sand, &c.

All fossils, without exception, may be brought home, in large number and quantity.

When fossils occur in sand or gravel, note their condition as to freshness or decomposition; whether they resemble those of the adjacent coast or seas; the mode of their occurrence; whether regularly interstratified with clay or stone; in patches, or continuously, on the sides of hills, or of cliffs, and at what altitudes above the sea.

State whether the fossils found in any given situation are all marine, terrestrial, or fluviatile; mixed, or in distinct groups; and, if mixed, in what proportions.

Observe whether there be any intermixture of freshwater and marine shells in bodies of water near the shore, or in lakes at a distance from it.

Inquire whether bones of mammalia occur among them.

Note the brackishness of the water, whether it communicates or not with the sea. State any differences of the animals from those of purely fresh, and of salt water.

Observe carefully the *position* of fossils in the beds which afford them. If corals, whether vertical or inclined? If shells, are they disposed in layers parallel to the strata?

Notice whether testacea are carried up to cliffs by birds; the quantity of shells thus accumulated, and the state of preservation.

Notice the relative numbers of shells of the same species on the shores.

Seek for and preserve all traces of *fossil bones*.

Be careful to ascertain that they are imbedded in the alluvium, not loose or intermixed with the *recent* detritus.

If any *bones* should be *dredged* up, note the place of their occurrence, latitude and longitude, its distance from any great rivers, whether within currents.

Bones in caves.—Examine the materials forming the bottom of caves for bones.

Bone-breccia.—Search for this in crevices.

Observe all indications of coal, and collect specimens; note any traces of vegetable impressions in the rocks, and preserve them carefully.

Seek with the microscope for infusorial animals, both in a fossil and recent state.

Coral reefs.—Attend to the structure and appearance of coral reefs and islands.

See, on this subject, Lieut. Nelson's Paper 'on the Geology of the Bermudas.'—Geol. Trans. 2d Series, Vol. V., p. 103—123.

Ascertain to what depth below the surface of the sea they extend, and, if possible, on what basis they rest.

Ascertain how far south they are found to occur.

Floating or drift wood and plants.—Record the distance from land, the latitude and longitude at which they are observed; their state of preservation; the position of the trees, if upright; if with their foliage or fruit.

Islands.—Examine all islets and detached rocks, and ascertain if they consist solely of one description of rock, or of beds of different composition. Take numerous specimens from the antarctic islands, with notes of position, &c.

Examine how far islands of the same group correspond in form, and in the direction of their hills and valleys.

When numerous islands are composed of the same material, examine whether there is any difference observable in the nature of the detritus, or gravel upon their surfaces.

Inquire what effect wind has in the formation or enlargement of land in southern latitudes.

Elevation of Land.—Observe appearances which indicate the elevation of land, as the high inclination, curvature, fracture, and open fissure of strata; sketches should be made where these are remarkable.

Endeavour to ascertain whether the lines or ridges produced by such elevations are continued to any great extent; and, if more than one such ridge be found, whether they are parallel.

In all islands, seek for traces of gravel and sea beach, at points above the present level of the sea. Measure, or estimate, the level of such places.

Terraces.—Record all indications of terraces, in valleys or along sea coasts; the extent to which they may be traced; whether horizontal or inclined,—interrupted, or traceable at intervals. If more than one line of terrace occurs in the same valley or cliff, determine or estimate their elevation above the sea, and the vertical distance between each terrace; examine the materials of which they consist, whether of shingle, sand, or clay; whether they contain any remains of testacea, and if so, whether the shells are marine or of fresh-water.

The elevation on the coast of Chili after the earthquake of 1802, has been questioned by MM. d'Orbigny and Gay (*Comptes Rendus*, 1837, p. 154). Seek for evidence on this question.

Depressions of the Land.—Notice carefully all indications of subsidence of land;—as of the tide reaching deserted houses, or other human works partially or wholly exposed at low water. Whether beds of peat, or stumps of trees, are exposed during any state of the tide, or can be seen constantly covered with water. In making these observations, attend particularly to the outline of the coast; and state whether these indications occur in estuaries, bays, or along straight, open shores, free from sand-banks.

Structure and Forms of Land.—Make drawings, as often as possible, of the land seen, whether visited or not. Where the apparent outline and structure of hills or lower tracts are the same, a few specimens from any one place will often indicate the general composition of the region.

Make profiles of the land and sea coasts; colour the latter, if possible, according to their composition; colour also, should opportunity permit, the coast views which accompany charts.

Attend, on all occasions, to the gradual or sudden deepening of the sea; also to the soundings of previous navigators, and note if there be at present any difference.

Make profiles of the soundings, and mark on them whatever the lead may bring up; if living shells, note on the label of the specimen the depth, nature of the bottom, latitude and longitude, distance from the nearest coast, &c.

If an opportunity offers of studying alluvial deposits, mark whether the beds of detritus are horizontal or inclined; if accumulated against abrupt cliffs; the manner in which the materials are disposed, whether horizontally or in sloping beds.

Obtain all the information possible respecting the increase of sand-banks, or the destruction of cliffs and islands.

If shoals or banks are discovered at a distance from land, procure as large a quantity as possible of the materials, to determine how far the shoals may have been formed by volcanoes.

If rocks or shoals, not previously noticed, should be discovered in seas frequently visited, carefully examine them: and if rocks and shoals, said to exist, should *not* be found, obtain, if possible, soundings, and preserve whatever the lead brings up.

It will be desirable, M. Cordier remarks (*Comptes Rendus*, 1835, page 371-2,) whenever an expedition is stationary, not only to *connect* the specimens and observations, but to attempt, if possible, a monograph of one or more hills or mountains considered as characteristic of the region where they occur. With this view, specimens should be taken from *all*, or a great number of the beds, from the bottom to the summit, with exact notes of their thickness. And a sketch or section should be made, marked with numbers corresponding to the place of the specimens respectively.

The last observation applies to specimens collected from *cliffs*. Such illustrated sections, with their corresponding series of specimens, should be made as often as possible.

Note the thickness of the beds, the dip, including the angle and direction; observe whether they be traversed by fissures; and the direction of the fissures with regard to the compass. If more than one set of fissures, note the direction of each set.

Stratification and Cleavage.—Where a cliff consists of beds of different materials, as sandstone, sand, clay, limestone, or slate, the change in the mineral character denotes the lines of *stratification;* if these beds are traversed more or less obliquely by fine cracks, or lines, these are indications of the *cleavage* of the stone.

This is an important character, and great care should be taken to distinguish it from stratification. A paper by Professor Sedgwick, in Geol. Trans. 2nd Series, Vol. III., ought to be consulted upon this subject; and endeavours should be made to determine whether the uniformity there pointed out in the magnetic bearing of the cleavage planes exists in the southern regions.

Floating masses of Ice.—Note their position with respect to latitude and longitude, and the stony or earthy materials which may be found upon or within them.

On the shores of islands, or on coasts much exposed to the action of floating icebergs, observe what effect is produced on the surface of the rocks by their friction.

Inquire if there be reason to believe that icebergs, when aground, stir up and disturb the sediment, or otherwise affect the bottom.

2. Erratic Blocks.

This name has been given to masses of rock often found loose upon the surface, which commonly differ from the stone of the country, and are sometimes very distant from rock masses like themselves. Seek for these, especially in islands, or at places above the present level of the sea. Take specimens of them; note their form, whether irregular, rugged, smooth, or polished; their composition, whether like any known masses seen elsewhere. If different from that of the rocks in the adjacent country; whether the rocks on which they rest are furrowed; if most numerous on the summits of ridges, or in valleys; if ar-

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Rendus, Aug. to Dec. 1835, p. 370 to 373);—with those of Mons. Elie de Beaumont, for the Geologists who accompanied the French Expedition to the North of Europe, 1838; (*Comptes Rendus*, Jan. to June)—of which a translation has been published in Jameson's *Edinburgh New Philosophical Journal* for 1838, Vol. xxv. p. 292 to 317. The last of these papers contains much information respecting the Northern Regions, which will deserve comparison with the Antarctic Phenomena.

In addition to the collection of Voyages which will of course be taken out, the Council would suggest, as connected with Mineralogy and Geology,—Cleveland's Mineralogy; De la Beche's Geological Manual, 3rd edition; Professor Phillips's Geology, 2 vols. 12mo. 1838; De la Beche's volume entitled 'How to observe;' Lyell's Elements of Geology; Boué's '*Guide du Géologue Voyageur*,' 12mo. 2 vols.; Darwin's Journal, &c., in the *Beagle:* Scoresby's publications on the Arctic Regions; Macculloch's Classification of Rocks; Bakewell's Geology, 5th edition; Lyell's Principles of Geology, 5th edition; Daubeny on Volcanoes, 8vo.; the French translation of Van Buch's description of the Canary Islands, 4to., with a folio of plates.

ranged in any order; if more numerous in one part of a ridge or valley than in others.

Great erratic blocks are said to occur on the shores of the New Shetland Islands, consisting of granite, which is not found to compose the adjacent rocks. See Cordier's Instructions; (*Comptes Rendus*, 1837, pages 152-154).

See the Account of an American Expedition of Discovery to the South Polar Regions in 1830.

For an account of the blocks in the glaciers of *Spitzbergen*, see De Beaumont's Instructions—(*Comptes Rendus*, 1838, p. 22.)

3. Volcanic Phenomena.

Record all indications of recent volcanic character; jets of smoke; of flame by night.

Connect the places where these are observed with the nearest observations of latitude and longitude.

In volcanic countries, or those liable to earthquakes, record all the remarks of the natives, and note particularly whether the people are silent with respect to changes of level.

Observe *indications* of extinct and of quiescent volcanoes. If vapours issue from the earth, observe their effects on the adjacent rocks, and procure specimens of the altered and unaltered stone; note the distance to which the change extends.

Where volcanoes are actually in eruption, record accurately the date and duration of their paroxysms; and, when the intensity varies, note the time of the greatest violence, and *contrà*.

Ascertain whether Neptunian substances are to be met with amid the detritus of volcanic islands; or volcanic substances amid the detritus of coral islands, &c.

Among the ejected masses, both of active and extinct volcanoes, many crystalline minerals may be expected. The masses should be broken, and closely examined, with a view to their discovery.

All the lavas of existing currents,—volcanic glass, obsidian, pumice, &c., should be carefully observed, collected, and examined for crystals.

Phenomena indicating former earthquakes should be carefully inquired after, and noted; and, in inhabited countries, an attempt should be made to ascertain the traditions on this point.

If dykes of lava, or of trap, traverse other rocks, ascertain whether any changes have been produced in the latter. Obtain specimens of the dykes, and of the altered and unaltered rocks.

Mineral Springs, Hot Springs.—Note their occurrence, the rocks from which they issue, and obtain a large bottle of the water. Also specimens of the sediment deposited by them. Record their temperature; the volume of water thrown out; whether they are uniform; or intermittent; whether gas be disengaged from them.

4. Heads of Inquiry at Specific Places.

Cape de Verd Islands, St. Jago.—There is a calcareous stratum near Porto Praya, containing fossil shells, which appear to be all of recent species; a full collection of these would be highly desirable. This stratum extends, in a nearly horizontal line, for several miles on each side of the port. To ascertain the limits of the stratum and its general horizontality at distant parts of the coast would be very interesting, as affording proof of an equable elevation of a volcanic island of not large dimensions. Some square-topped hills at the distance of a few miles from the coast, belong to a more ancient period than the volcanic rocks of the shore; their stratification and form indicate that they form part of a grand circle, which would come under the class of the so-called "craters of elevation." If the geologist has opportunities of visiting places distant from the vessel, the relation of these hills to the general structure of the island will be highly deserving of his attention.

St. Paul's Rock.—Compare this place with Mr. Darwin's description—(Journal, pp. 7-8).

St. Helena.—The beds of mould, which contain abundant land-shells, on the flanks of Flagstaff-hill, are deserving of close attention, as probably several species, and perhaps even bones of birds may be discovered in them.

Mauritius.—It has been the opinion of several naturalists who have visited Port Louis, that the mountains in that neighbourhood form part of an enormous "crater of elevation." The examination of the stratification of the hills (Mount Bamboo) on the western and southern sides would decide this question; and would afford probably some most curious results. If the geologist can ascertain in what part of the island the bed was discovered, which contained the bones of a land tortoise (a collection of which would for several reasons be very interesting),—and of the Dodo, he will of course carefully examine it.

Isle of Bourbon.—In an old French book of travels ('*Voyage par un Officier du Roi*,') it is said, that there are appearances in the land here which indicate that the sea formerly occupied a higher level.

Kerguelen's-Land, and neighbouring islets.—Geology wholly unknown. Do there exist any proofs of the recent elevation of this land? The presence of erratic boulders should be carefully sought for; also of the "*Moraines*" of Glaciers, or any appearances indicating a lower descent of glaciers in former periods than at present. It is doubtful whether glaciers descend to the sea-coast of the island during winter.

The entire Fauna, although probably exceedingly limited, of these islands situated between Africa and Australia, and so far distant from other land, is well worthy of the greatest attention, as serving to throw light on the geographical limits of certain forms.

In Cook's third voyage (4to. vol. i, p. 51 to 90) a copy of which will be in the ships, a map of some detail is given of the north-eastern coast of Kerguelen's Land; with a plate exhibiting three views of the land near Arched Point, and two more distant views, which include an extensive range of mountains. In the former of these views it will be perceived, that some of the land near Arched Point is arranged in terraces, apparently consisting of strata nearly horizontal, with almost vertical cliffs on escarpments. The more distant views and the map show, that some of the mountains are lofty, and disposed in one or more ranges. Observations relating to these mountains; their heights above the sea; an account of their general structure, composition, the direction, inclination, and cleavage of the strata, —with a full collection of specimens, and views and sectional sketches of the coast, will be of the highest interest. As the expedition will probably remain at Kerguelen's Land for several days, an opportunity will be afforded of reaching the interior as well as the mountains near the coast, and of obtaining an extensive collection of the rocks, and, probably, of ascertaining several points of structure. In a more recent map, by the Captain of a South Sea whaler, dated in 1799, (now in the Hydrographer's Office,) it is stated, that some of the mountains are covered with perpetual snow. If this be so, the determination of the height of the snow line will be of great value.

Van Diemen's Land.—The prevailing strata near Hobart Town contains shells resembling those of our carboniferous series; a full collection of them, especially from some distant part of the island, (as the formation extends to the northern shores,) would be very interesting. About a mile north of Hobart Town there is one small quarry of travertine limestone (burnt for lime), which contains the leaves of plants not now found in that country; it is said that shells (and bones?) have, though rarely, been found in it: these, especially any bones, and the leaves, are deserving of careful collection. On the shores of Storm Bay there are obscure appearances of a raised beach. Some miles east of Hobart Town there is said to be a great accumulation of oyster-shells, which have been quarried for lime. Ascertain if all these shells are of recent species. In the northern parts of the island large caverns are said to exist in the limestone formation: the great probability of their containing fossil remains need scarcely be alluded to; and if any be discovered, their high interest, as compared with the extraordinary fossils brought by Sir Thomas Mitchell from Australia, is certain. No coal plants have yet been sent from the coal strata of Van Diemen's Land.

New Zealand.—On the banks of the valley of the Thames river, parallel terraces are said to occur: inquire into their origin. On several parts of the coast there are large accumulations of sea-shells; inquire if all these were brought thither by the natives, or if they indicate a change of level.—Inquire if New Zealand was always as barren of terrestrial mammalia as at present.—The modern tertiary deposits which are said to exist on the coast should be most carefully examined.

Land in the Antarctic Regions.—The officers engaged in the expedition will feel that *everything*, from any part of the Antarctic Regions, whether specimens of rocks, or of fossils, or recent shells, or information as to geological structure and phenomena, is of the highest interest.

In very high southern latitudes, the discovery of coal, and especially of shale, with impressions of plants, would be of great interest: these have been discovered in high northern latitudes.

If any slate rocks occur in the islands south of South America, examine whether their cleavage presents an uniform direction, such being remarkably the case in Terra del Fuego.

Staten Island.—Captain Foster remarked, that at the north-western extremity of the mouth or entrance of North Port Hatchett there are extensive beds of *graphite*, or black lead, of a good and fine quality; and that the roofs of the large caves are composed almost entirely of this substance. It would be very desirable to obtain specimens.

South Shetland Isles.—At Deception island, it is said, volcanic ashes have been observed alternating with ice.

The existence of burning volcanoes in high southern latitudes would establish the universality of their occurrence over the whole globe. Jan Mayen's Island (north lat. 71°), is a volcano still in activity. —See Scoresby.

Ascertain whether there are, in any parts of the shores of the Antarctic regions, cliffs of mud and gravel, permanently frozen, for a few feet below the surface, such as are found on the shores of the Arctic sea.—[See Dr. Buckland's Geological Appendix to Captain Beechy's Voyage.]

The acquisition of fossils, whether animal or vegetable, in high southern latitudes, is of the highest importance to Geology.

Icebergs.—Compare, generally, the phenomena of Icebergs and Glaciers in the antarctic regions, with the accounts given of those in the north.—See on this subject the works of Scoresby; also De Beaumont's instructions; (*Comptes Rendus*, 1838, p. 21).

Section III.—Botany and Vegetable Physiology.

The duty of the Botanist should be, to collect specimens and preserve evidence concerning every department of Botany and Vegetable Physiology, not merely in illustration of these subjects as branches of Science, but with reference to purposes of general utility.

The vegetation of the Antarctic regions and of the most southern countries which the expedition may visit, should be an object of especial attention, for however sterile and uninviting a place may appear to be, it is most desirable to know exactly what plants those regions produce. Here, therefore, and at all other places, as complete an herbarium as possible should be formed. At Kerguelen's Land, of which the Flora is so little known, this is especially necessary: even at St. Helena, the Cape of Good Hope, and Hobart Town, carefully as the botany of these places has been examined, a dried collection of plants should be made, especially of the lower orders of phænogamous vegetation and of aquatic and submersed plants, whether of fresh or salt water. Fungi also, and Rhizanths, should be diligently sought for, and all those minute species of cryptogamic plants which are parasites.

Though but little accession to our knowledge of Systematic Botany can be anticipated at any of the principal stations of the expedition, many new and interesting facts may be collected in Physiological Botany, if anomalous forms of vegetation be examined, as concerning these so little that is positive has as yet been ascertained in foreign countries. Collections should be made of the stems of Casuarinas, Urticaceous trees, and of twining woody plants, the internal structure of which is frequently at variance with the ordinary plan of vegetable formation. Diligent search should also be made for cases of the occurrence of the embryo buds of Dutrochet. It is probable that attention skilfully directed to these last productions, will throw light upon some of the most obscure points of Vegetable Physiology. Most

of the specimens of this kind may be preserved in a dry state, but as some will require to be kept moist, it is requisite, for this purpose, that the Botanist should be supplied with bottles, jars, acetic acid and spirit.

Attention should be especially directed to the distribution of remarkable species in each country, regard being paid, in particular, to the elevations at which they are found, and the soils which they seem to prefer, where preference is observable. Connected with this topic are the limits to which cultivated plants extend, and the circumstances under which they succeed or fail. In noting points of this nature, facts concerning the commoner species will be interesting, because they are so frequently neglected, and because of the evidence as to climate which they may be expected to afford. In the absence of this kind of knowledge, it is difficult for persons here to judge correctly respecting the kind of plants it may be desirable to introduce into another country. Should the causes of failure or of success in the cultivation of particular plants be apparent, they ought to be noted down. As an instance of the importance of this branch of inquiry, the Vine at the Cape of Good Hope may be mentioned: the bad quality of Cape wine, with the exception of that produced at the farm of Constantia, is well known: can any physical cause be assigned for this circumstance? If exotic plants are commonly cultivated with apparent success, they should receive particular notice; European Oaks, for example, are common about Cape Town, where they are planted for their shade; the species to which they belong, and the effect of that climate upon their growth, and the quality of their timber, are points deserving of attention.

The original Flora of St. Helena should be fully investigated and carefully distinguished from that which has been gradually formed there by the introduction of numerous plants from various countries. The association of plants in this island will be found extremely curious, and the circumstances which enable species of very different habits to flourish equally well in the same place, notwithstanding their constitutional diversity, are deserving of particular attention. A very detailed catalogue should be formed of these exotics, the degree in which they are affected by their new country should be observed, and an attempt be made to discover the causes which are favourable to the maintenance of so singularly mixed a vegetation in so small an island. Such a catalogue, if well prepared, may be expected to illustrate many difficult and important questions which are connected with the relation borne by vegetation to climate.

Both at St. Helena and Hobart Town, Tree Ferns will be found, those in the former place have the stems destitute of external fibres except near the ground, while the Tree Ferns of Hobart Town are thickly covered with similar fibres from the very summit. The origin of these fibres, and the circumstances under which they are produced, are unknown, and should, if possible, be determined; indeed, the manner of growth of these plants in all other particulars is an interesting subject for careful investigation, as are also the circumstances under which this tropical form of vegetation is produced upon Mount Wellington. In the event of the expedition visiting the southern part of New Zealand, it should also be ascertained under what conditions the Tree Ferns that exist there extend so far beyond the usual geographical limits of such trees, and also whether they are not accompanied by other forms of an equally tropical character.

The northern coast of Van Diemen's Land being in many respects clothed with a different vegetation from the south side, it is desirable to notice the peculiarities of each. At Emu Bay, there exists the Gunnia australis, an orchidaceous epiphyte, which is far to the southward of the general range of plants of that kind. It will probably be found that this apparent exception to general rules is dependent upon some local peculiarity of climate. Possibly other species with similar habits occur on the same line of coast; they should be sought for, and particular attention should be paid to the plants with which the orchidaceous epiphytes are associated.

A principal object of inquiry should be, plants yielding useful products of all kinds. It is in this way only that the resources of foreign countries can be ascertained, and it is presumed that in an expedition which will be stationary for considerable periods of time, such inquiries can be easily made. Under the head of useful products the following may be particularly mentioned:

1. *Dietetical, medicinal,* and *poisonous agents* of all kinds. The nature and action of the poisons employed by the natives of many countries are but slightly known.

2. *Dye Stuffs.* Attention should be paid, especially to obtain Lichens, as substitutes for the *Roccella tinctoria,* now becoming scarce, and consequently very valuable in European commerce. The fitness of these plants for this purpose may be approximately ascertained by Hellots' lichen test, which is as follows: digest the lichen at a temperature of 130° F. for a few hours, in a weak solution of ammonia, but sufficiently strong to be tolerably pungent. One that is fit for the dyer will yield a rich violet red liquid.

3. *Astringent substances adapted for tanning.* It is desirable to ascertain with accuracy the source of the various astringent extracts imported from New Holland and the neighbouring parts, and which are employed by the tanners of this country.

4. *Fibres adapted for cordage and weaving.* Substitutes for Hemp are very desirable. Great strength, flexibility, and freedom from injurious influence in working are three essential qualities of good hemp.

5. Information respecting the source of many of the *ornamental woods* imported from the southern hemisphere is very imperfect. It is desirable, therefore, that inquiries be made on this subject as well as for new kinds of wood.

6. *Gums, resins, volatile oils, fecula.* Especially the source of some resins brought to this country from New Holland, and which are analogous in some properties to the *yellow resin* of that country.

In forming collections of such objects, especial care must be taken when collected to number alike both the products and the plants by which they are furnished, and to note whatever can be learned concerning them, more particularly with regard to their abundance and the facility with which they can be procured. It is also necessary that the observations made by the Botanist himself, should be carefully distinguished from such information as he may receive from other persons.

No opportunity is to be lost of collecting information respecting the source and mode of preparation of any vegetable substances known in commerce; for many exotic products, even those with which we are most familiar, have many points connected with their natural history deserving attention.

The vegetation of South Shetland cannot be expected to furnish much that can be made available for purposes of commerce, except Lichens. With respect to these plants, however, it is possible that species fit for the purposes of the dyer may be found in those southern latitudes; and if such should prove to be the case, an additional source of profit may become available for the South-sea traders.

Where the native names of useful plants can be correctly ascertained, they should be preserved; but care must be taken to avoid error in this respect. Implicit credit must not be given to the statements of individual natives; it is only by comparing the separate evidence of different persons, that correctness can be expected.

Collections should be formed of the seeds and bulbs of useful and ornamental plants wherever opportunities occur, and they should be forwarded to Europe from time to time. It is also recommended that duplicate collections be transmitted to the Supreme Government at Calcutta for distribution among the botanical gardens of India. In packing these collections, the best method is to inclose each kind of seed in separate packets of brown paper, which should be placed loosely in canvas bags, or in boxes with holes in their sides, and arrangements should be made for their being transmitted in a cabin, or some well-ventilated part of the ship. Among those seeds which it is more particularly desirable to procure, may be mentioned the arborescent Compositæ of St. Helena, and the native Coniferous plants of all countries, particularly the Phyllocladus or Celery-leaved Pine, and the various species of Athrotaxis inhabiting the mountains of Van Diemen's Land. As the seeds of such plants are apt to suffer from long keeping, and as other instances may occur when it would be desirable to send home young plants instead of seeds, it would be advisable that the expedition should be supplied with one of Mr. Ward's glazed cases, to be used if occasion should arise.

Light is an agent which operates so powerfully upon plants, determining the amount and even nature of their secretions, and influencing in the most essential manner their vital actions, that it would be most interesting to obtain, if possible, some good photometrical observations. The extreme and mean temperatures of the atmosphere, its humidity, the quantity of rain, and the temperature of the earth immediately below and within a few feet of the surface, have also a direct and important bearing upon Vegetable Physiology, especially when considered with respect to the distribution of plants, and the arts of cultivation. Observations upon all such points tend to explain the connexion which exists between vegetation and climate, and should be introduced by the Botanist into his report, notwithstanding that they also occur in the Meteorological Journal.

If the observations here recommended be briefly noted in a tabular form, and at the time that they are made, the registration of much useful matter which might otherwise escape recollection, will be secured, and a valuable document formed for future reference.

In conclusion, the Council most particularly recommend that the Botanist to the expedition be directed to number all the objects collected by him in one consecutive series; that the dried specimens, seeds, woods, and productions of all kinds, shall correspond in number with the plants producing them, and that two complete collections be prepared for Government, of which one shall be for incorporation with the general collections belonging to the public, and the other be preserved separately, to illustrate the botany, &c. of the expedition. The Council also recommend that both these collections be delivered up within six months after the return of the expedition; and, finally, that a report upon the botanical results of the expedition be furnished to Government within six months after its return, every plant or object mentioned in the report bearing the number of the specimens in the collections to be delivered up as above recommended.

Section IV.—Zoology and Animal Physiology.

1. Marine Invertebrata.

The animals which it is desirable to preserve, and which may first present themselves to the notice of the naturalist in the present expedition, are the floating marine *Mollusca* and *Crustacea,* and those which inhabit the Sargazzo or Gulph-weed.

With respect to the *Mollusca,* all the species of the *Cephalopoda* or cuttle-fish tribe, and all the *Pteropoda* or lower organized floating Mollusca, should be preserved. If taken alive, they should be allowed to die gradually in sea water, by which means they commonly remain in a relaxed state, and display more of their natural outward form. When dead, they should be soaked for a short time in fresh water, and then put into spirit, or if transparent, in the saline solution,* to prevent decomposition, which otherwise rapidly takes place.

To each specimen should be attached a number, stamped on sheet tin, corresponding to the entry-number in the Catalogue, in which should be noticed the kind of locomotion, or other vital phenomena, and the colour of the living animal, the latter being speedily altered or lost in the preserving liquor. The larger Crustacea will be liable to become putrid in spirit, unless the soft mass which fills a large portion of the body, consisting of the liver, &c. be removed. Each specimen of this class, excepting the very minute ones, which will be best preserved in small phials or glass tubes, should be wrapped in a piece of very soft, thin linen or cotton cloth, to prevent the legs from being intermixed or lost, as they are very likely to fall off after having been a short time in spirit.

A very important object of investigation is the developement of the Crustacea, from the earliest period at which they can be observed to the perfect state. They may be readily examined even before they leave the egg, by opening the egg under a single microscope. Drawings of these changes are very desirable, and when practicable the eggs and young

* Common salt, 1 part; alum, 2 parts; boiling water, 10 parts. Filter the solution when cold.

ones in different stages should be preserved in spirit in short glass tubes. The smaller oceanic Crustacea offer a prolific and hitherto unexplored field of investigation.

Among the floating Mollusca likely to be met with in the tropical latitudes is the *Spirula*, a small Cephalopod with a chambered shell. An entire specimen of this rare Mollusk is a great desideratum: and if it should be captured alive, its movements should be watched in a vessel of sea water, with reference more especially to the power of rising and sinking at will, and the position of the shell during those actions.

The chambered part of the shell should be opened under water, in order to determine if it contain a gas; the nature of this gas should likewise, if possible, be ascertained. As a part of the shell of the *Spirula* projects externally, at the posterior part of the animal, this part should be laid open in the living *Spirula*, in order to ascertain how far such mutilation would affect its power of rising or sinking in the water. In the event of a living Pearly Nautilus (*Nautilus Pompilius*) being captured, the same observations and experiments should be made on that species, in which they would be attended with more precision and facility, as the species is much larger than the *Spirula*, and its shell external. The towing-net should be kept overboard at all practicable periods, and drawn up and examined at stated intervals, as some of the rarest marine animals have been taken by thus sweeping the surface of the sea.

A sketch or drawing of Molluscous and Radiate animals, of which the form and colour are liable to be materially altered by death, or when put in spirit, will aid materially in rendering the description of the species useful and intelligible. The *Echinodermata* and *Asterias echinus*, and similar forms, should be soaked in fresh water previously to their being put into spirit.

Care must be taken not to crowd too many soft-bodied Invertebrata in the same bottle, and to change the spirit or preserving liquor at least once, if not oftener.

2. Fishes.

The mode and speed of swimming, living colour, temperature, and any other peculiarity, should be noticed before placing the specimen in spirit.

In very large specimens of the Shark or Ray kind, a section of the jaws, with a part of the vertebral column, should always be preserved as wet preparations, and the remainder of the jaws and vertebral column in a dry state. The eyes, eyelids, and part of the surrounding skin should be preserved in the saline solution. In less bulky specimens the entire head should be taken off by dividing the fish below the heart across the upper part of the liver, by which means the mouths of the oviducts, if it be a female, the heart, gills, and head are all preserved together.

The tail of a Shark may be taken off a little below the anus, and the trunk alone preserved for examination. If the trunk be too large, it should be cut through above the pelvis, and the parts contained in the hinder portion, as the claspers of the male, should be preserved in spirit. If the specimen be a female, separate the two oviducts through their whole length, where they run along the abdomen, on each side of the spine, but keep them attached to the cloaca and its surrounding parts.

If with young, or eggs, take the whole out in the same way without opening the oviducts.

The heads of all fishes should be preserved, when the specimens are too large to be preserved entire.

All external parasites, and those which infest the gills of fishes, should be preserved. The alimentary canal should, in all cases, be examined for the presence of the entozoa, which, if adherent to the coats of the intestine, should be preserved with the part to which they are attached. One of the most interesting fishes of the Southern Seas is the Port Jackson Shark (*Cestracion Philippi*). Moderate sized specimens of this species should be preserved entire: and the head, vertebræ, with the dorsal spines, viscera, and especially the impregnated oviduct, should be preserved. The Southern Chimæra (*Callorhyncus antarcticus*) merits also the especial attention of the Naturalist, and the same specimens of this species should be preserved, as of the Cestracion.

3. Reptiles.

Specimens of Turtle should be carefully examined for parasitic animals; a curious Barnacle (*Chelonobia*) and a Leech (*Hirudo branchiata*) are occasionally found adhering to these marine Reptilia.

In the event of the expedition touching at the Galapagos Islands specimens of Amblyrhynchus, a lizard of marine habits, should be secured, and the particular locality of the capture noted.

4. Birds.

The *Cuionis* or Sheath-bill of the Falkland Islands and Cape Horn.

The Great Penguin (*Aptenodytes*).

The Penguin of the Isle San Lorenzo.

Of these rare and desirable birds, besides the prepared skins, the entire body should be preserved in spirits for anatomical purposes. The young of the Great Penguin, and the eggs at different stages of incubation, should likewise be similarly preserved.

5. Mammalia.

The skulls, skeletons, and viscera of a specimen of each species of the *Cetacea* of the Southern Ocean are worthy of being preserved. With respect to the Sperm Whale, an entire fœtus, or, if of large size, the brain, eyes, pharynx, larynx, and blow-holes, and the viscera; a part of the impregnated uterus; the ovaria, and a portion of the membrane of the fœtus; are all parts worthy of preservation.

The same observations apply to the great Elephant-Seals (*Phoca* (*Cystophora*) *proboscidea*). Of which the skull and skeleton of both male and female are very desirable.

The skulls or skeletons of all the species of the Southern Seals should be preserved, the sex being noted.

6. In Particular Regions.

In Australia or Van Diemen's Land the following species are more especially worthy of attention.

Thylacinus Harrisii, Hyæna of the Colonists.

Of this species the skeletons of male and female, detached skulls, an entire specimen in the saline solution for dissection, the viscera, and more especially the impregnated uterus, and a young specimen for the changes in dentition are particularly desirable; such specimens not having been as yet transmitted to the museums of this country or on the continent.

The skeletons, skulls, and female organs of every marsupial quadruped, and of the *Ornithorhynchus* and *Echidna* (or Porcupine of the Colonists) should be preserved.

The smaller Mammalia of Australia, whether Marsupial or Rodent, should be preserved in spirit, and particular notice taken of their locality and habits.

Among the birds of Australia the Lyre-Pheasant (*Menura*) would be an interesting subject for anatomical investigation. Of this species are wanting the skeletons of a male and female, and of the young bird; and the entire body of both sexes in spirit, or the saline solution.

The same with respect to the large-billed Cuckoo (*Scythrops*), and Sea-Partridge (*Glareola*).

In New Zealand similar preparations should be obtained of the *Megapodius* and of the *Apteryx australis*.

With regard to birds it may be observed, that if spirit be injected down the windpipe, it will pass through almost the whole body by means of the air-cells. In the case of a quadruped preserved in spirit, or in the saline solution, it is proper to inject the preserving liquor into the abdominal cavity and intestinal canal.

NEW MEMOIR OF MRS. HEMANS.

To the Editor of the Athenæum.

Sir,—It is with reluctance that I obtrude myself on the public; but I feel that the misconceptions to which the Memoir of Mrs. Hemans written by her sister and affixed to the complete edition of her works, has given rise, leave me no alternative.

The tone of the earlier part of the Memoir, and the total abstinence from all reference to the 'Memorials' published by me in the year 1836 (of which, however, most liberal use has been made) might naturally lead the public to conclude that my work had been offensive to its writer, and published not only without the concurrence, but in opposition to the wishes of Mrs. Hemans' family. I felt this so strongly, that, after reading the Memoir, I at once addressed a letter to the sister of Mrs. Hemans, calling her attention to the subject. That lady was then on the Continent, and answered my communication by a message, thus delivered to me by one of her nephews:—

"She bids me tell you, that she had not the least idea there was anything in her Memoir of my mother, which you could have taken in the sense you seem to have done—which, she thinks, is best proved by her having especially charged Henry and myself to send you a copy of it; that she fears you have taken as applying to yourself some expressions which were meant for two spurious and extremely disagreeable little books, professing to give the history of my mother's life, which she had originally specified by name, but was dissuaded from doing so by Blackwood, who said it would only be bringing them unnecessarily into notice."

With this explanation (subsequently confirmed in a letter addressed to myself) I should certainly have let the matter rest, had I not found that an impression to my disadvantage had been generally adopted by the press; *The Spectator*, June 1st, having pointed me out "as invading the sanctity of private correspondence, and publishing letters to the evident dissatisfaction of Mrs. Hemans' family;" and *The Examiner* of August 4th, repeating the charge in more qualified terms. Under these circumstances, I cannot but rectify the mistake by a brief statement of the circumstances under which I undertook to write the 'Memorials,' and of the manner in which they were received by Mrs. Hemans' family.

It was in the year 1835 that I communicated to the *Athenæum* an Obituary notice, and three papers of hasty personal recollections of Mrs. Hemans—the last of which appeared on the 11th of July. About the same time my brother was applied to by Major Browne (Mrs. Hemans' brother and executor) to assist him in arranging a complete edition of her poems, to be accompanied by a memoir. My brother declined, on the score of engagement, pointing out, however, the *Athenæum* papers, and mentioning me as a probable substitute. In consequence of this, I communicated with Major Browne, and received a letter, dated July 27th, in which he expressed his entire concurrence with the proposal. Some delay took place; and, subsequently, I received on the 11th of November, a letter, stating that the plan of a complete edition, &c. was abandoned, and containing the following passage:—

"It had always been my intention to avail myself of your obliging offer, and to associate you with myself in preparing for the press everything of my late lamented sister's which had appeared—but.... here follows a reason of a private nature, which in no way concerns myself). "I was much pleased," continues the letter, "with your first notice of my sister in the *Athenæum*, after her death, but the insertion of some of her letters subsequently, I fear, gave offence to some worthy people, which I must regret; however, I feel quite satisfied of the kind interest you and your brother always took in her character and writings, and the welfare of the family; and I am very sure you would not have published the letters in question had you supposed they would have given pain to her friends."

I have purposely given this latter passage, as the strongest expression of "dissatisfaction"—concerning even the *Athenæum* papers,—ever conveyed to me by any member of Mrs. Hemans' family.

Previously to this time, I had been urged and invited to extend and republish the papers in question. This, for obvious reasons, I had declined. On the matter being again pressed upon me, I addressed the sister of Mrs. Hemans on the subject, resolved that unless I received full concurrence on the part of the family, I would not proceed. I stated that after having remunerated myself for the task of writing and compiling, I should but consider myself as the steward for Mrs. Hemans' sons,—and the meditated publication as *their*, not my, property. It is almost needless to add, that this intention has been fulfilled. To my letter, I received an answer dated the 28th of March, 1836, containing not merely sanction and best wishes, but materials in the shape of extracts from Mrs. Hemans' correspondence. Till that letter arrived, I had not felt at liberty to proceed. Subsc-

quently, I received further assistance from the same source, in the shape of notices, recollections, &c. The sons of Mrs. Hemans, too, co-operated with me; and it is partly owing to the correspondence procured by themselves and their aunt, from parties, to whom I felt I was not at liberty to apply, that my Memorials assumed their present extended form—though still, as I stated in my preface, neither aspiring to nor attaining "the completeness essential to a regular biography." It only remains for me now to state the manner of their reception by Mrs. Hemans' family. On their appearance I was favoured with the following note, dated Bronwylfa, 5th Sept. 1836:—written by the sister of Mrs. Hemans, and author of the recent Memoir.

My dear Sir,—I beg you to receive my hearty thanks for your very kind attention, in presenting me with your delightful book. To tell you with what deep interest I have read it, would be superfluous. It is, in fact, the only *continuous* reading I have been able to apply my mind to. * * * I am sure it will be a pleasure to you to hear how entirely both my brother and myself approve of the manner in which you have worked out your materials, and the discretion with which you have avoided any topic that could give pain or annoyance to any one. It is difficult to divest one's self of the feeling of a sister, sufficiently to judge of the work as an impartial reader,—but to me it seems impossible that all should not be charmed with it. This house is peopled with copies of it, but yours, you will be glad to hear, was two days in advance of those we ordered from our Chester bookseller. The dedication to Henry and Charles has been a delightful surprise to both of them, and I can quite enter into all the feelings it has called forth. I could say much on this subject * * * but I am sure, my dear sir, you will kindly make allowance for this very inadequate expression of obligation, and accept the sincere good wishes of Yours, very truly, &c.

I have only to add, that nothing but the impossibility of remaining silent under the reiterated charge of indiscretion, amounting to a breach of integrity, could have forced me into the publication of this letter. I trust now that I have sufficiently explained the real state of the case to those to whom I am personally a stranger, and with thanks for the opportunity here allowed me, must remain, dear sir, your obliged, HENRY F. CHORLEY.

London, August 15th, 1839.

KING OTHO'S TOUR.

King Otho, of Greece, and his young Queen, have been lately making a tour of four or five weeks duration through the northern part of their dominions. As the account reaches us through the *Augsburg Gazette*, we must take the evidence it contains of the political feelings and general content of the inhabitants for no more than it is worth, but the poverty of the country, and the simplicity of the preparations made for the reception of the party, render the account more amusing than that of most royal progresses.

The writer relates with great pride, that, whatever people may think of the state of the streets in Athens, the royal pair and their suite set out on their tour in carriages with four horses, but a regard for the safety of their necks seems soon to have induced them to change this stately mode of travelling for the more convenient one of riding on horseback. Many of the roads, indeed, were formerly scarcely practicable for any animal but a goat, but they are said to have been considerably improved under the present government. The formation of good lines of communication—an important object at all times—is a matter of the most vital necessity to a country in the situation of the modern kingdom of Greece. The population of the provinces, scattered thinly among innumerable mountains, are exposed to the depredations of robbers, to whom the rugged fastnesses afford the most perfect concealment. For weeks together, in the remote villages, the post-man is the only visitant, and, when any attempt is made to remedy a disorder by legislative enactment, the magistrates are scarcely able to read the decree when it reaches them. The moral, still more than the material interests of Greece, imperatively require the opening of good roads, and we are glad to hear that the government is directing its attention to this important object. It is expected that within a twelvemonth there will be a good road from Athens by Eleusis, Megara, and Corinth to Nauplia, Argos, and Trepolizza, and on the other side to Thebes and Livadia, and northward to Salona. The people have generally shown the greatest readiness to co-operate in these undertakings, and in many places have voluntarily agreed that every proprietor of land should execute seven days' work on the road the most likely to be advantageous to his property; and many of the distant villages have set vigorously to clean and repair their cross-roads, which have been almost impassable for the last twenty years.

The royal cavalcade stopped to breakfast among the ruins of Eleuthera, and reached Thebes at sunset, where it was met by a numerous party on horseback, and a great part of the population of the city carrying flags. The road was *illuminated* as it was called, for the occasion, that the royal visitors might have a chance of entering the city with unbroken bones. Of all the Grecian cities with the exception only of Corinth, Thebes bears the most evident traces of the devastation caused by the war. Above the ruins of the ancient Kadmeia may be traced others of more recent date, and these are again covered by the remains of buildings destroyed in the late struggle. Among the lions exhibited to the sovereign, were the pits in which the celebrated *Meerschaum* clay is found. This beautiful mineral is usually met with scattered about in lumps, and is easily cut with a knife into pieces fitted for pipe-heads. The manner in which the work is executed in these mines is of course slovenly in the extreme, and a proposal has been made to the government, we believe by a German of the name of Russegger, to undertake a complete mineralogical survey of the whole country. The road from Thebes to Livadia touches on the Copais lake, the waters of which are often so high as to inundate the surrounding country. Some clumsy attempts appear to have been made to reduce its level, but since the death of the engineer the works have been at a standstill. The road was often under water, and before reaching the Cephissus, the party had to ride through two little rivers. It is said that the inhabitants encourage the inundations for the sake of their rice fields, which require to be laid daily under water. Our informant lays all the blame for the neglected state of the roads on the local authorities.

The whole population of the villages, including infants in arms, and frequently people of more than a hundred years old—poured out to gaze on the showy dresses of the royal personages, and of course to testify the most unbounded affection. Troops of young girls with complete helmets of various coins—their necks and long braided tresses decorated with coral, surrounded the queen, dancing and singing before her, whilst the men loyally squabbled for the honour of approaching the king and leading his horse. At Turkochori, the clergy advanced in procession and presented the Testament, which the sovereigns saluted according to custom; and this, being considered as indisputable evidence of their attachment to the cause of religion, called forth the loudest acclamations. At this place the house appointed for their reception, which as well as many others in a similar state rejoiced in the title of "*Palace*," consisted of three stories, but the chambers were so small and low that the whole space was not more than sufficient for one large room. The entrance to the royal apartments, on the middle floor, was from the outside, by a set of broken stone steps, terminated by a ladder, and the walls had the advantage of admitting the light of day through numerous chinks, while the smoke of many years had reduced the ceiling to a tolerably uniform black. The walls were, however, covered with flowers and green boughs, and the floor with a sort of mosaic of various pieces of carpet patched together. But "the more simple the accommodations," says our authority, "the more cheerful became the temper of the party. The noble and contented spirit evinced by the royal pair, and the joy of the people, made happy by the presence of their King and Queen, diffused a tone of gaiety and animation through the company, which might have been envied by the inhabitants of costlier palaces." On one occasion, when the King's birthday was to be celebrated by a ball, the only music to be had consisted of a chorus of male voices, accompanied by the ringing of glasses and the clashing of swords.

The schools, visited during the progress, appear to have been in the most deplorable state imaginable; so much so, that it was sometimes thought necessary for the sovereign to express some dissatisfaction: it is not, however, stated that any measures for their improvement are in contemplation. During a great part of the journey, the country was too poor to afford even the merest necessaries, and above a hundred horses were employed in carrying beds, furniture, and provisions. The Plain of Thessaly has become almost an uninhabited wilderness; and, on the whole—in spite of the wish of the writer to present things under the most favourable aspect, and notwithstanding his sentimental delight in the troops of village maidens with garlands of flowers, and their venerable grey-headed sires, brimful of loyalty, who bestowed their tediousness upon King Otho—the general result from the few facts we can gather, is, that the state of the country is wretched in the extreme. It is, therefore, droll enough to find the whole account summed up with a "thus we may see that there does not exist a more flourishing, prosperous, and improving peasantry than that of Greece."

OUR WEEKLY GOSSIP.

WE published some time since (No. 610) the letter, addressed by the President and Council of the Royal Society to such Foreign Societies and distinguished individuals as were likely to take an interest in the subject, respecting a concerted system of observations to be carried on simultaneously in furtherance of the objects of the Antarctic Expedition about to leave England. We have this day the further pleasure of submitting to our readers the Report made to the Lords Commissioners of the Admiralty, at their request, by the Council of the Society, on all those subjects to which it was especially desired that the attention of Captain Ross and his officers might be directed. We need not enlarge on the scientific value of such a Report. The Council considered the inquiry so important that each subject was referred to a Committee consisting of those members especially conversant with the particular branch of science; and the reports of these several committees on Physics, Meteorology, Geology and Mineralogy, Botany and Vegetable Physiology, Zoology and Animal Physiology, were then submitted for consideration, and, on approval, adopted by the Council. It would be unbecoming in us even to offer an opinion on such a document, which embodies the combined knowledge of the most distinguished scientific men in the country. There can, however, be little risk in assuming its vast importance, not merely as a guide to the able and excellent officers who will be engaged in this particular expedition, but to observers all over the world. We shall give the Fifth and concluding Section, the Instructions for making Meteorological Observations, with the Appendix, next week.

Since our last publication, the picture selected by the Society for the Encouragement of British Art—*Hope*, painted by Mr. Boxall—has been disposed of by lot, the prize being won by the Hon. Mrs. Marlay; and a copy of the engraving from Mr. Linnell's *Journey to Emmaus* presented to each subscriber. The prize is certainly one of Mr. Boxall's best works: without being a *replica* of his well-known *Cordelia*, the sainted virgin, perhaps from the similarity of her attributes, purity and devotedness, reminded us, at a distance, of Lear's daughter, but—a little slovenliness in drawing being excused,—for sentiment, expression, and simplicity of treatment, the picture does honour to the artist, and to the good taste of the committee by whom it was selected.

News has arrived from Paris of the great success of Donnizetti's '*Lucia di Lammermoor*,'—done into French, and performed at the *Renaissance*—by an English *soprano* (Mme. Thillon), an Italian *tenor*, and a French *basso*, so much to the composer's satisfaction, that he has promised to set his machine to work, and to provide them with the score of a new opera by the 1st of January next. It is a pity that a theatre, intended for the cultivation of French art, should thus lend itself to the propagation of a feeble and sickly taste; we would far rather have heard of Auber—not Donnizetti—furnishing occupation for Mme. Thillon's voice (which is said to be clear and extensive), and for her neat and brilliant style. But, when the English manager of the English Opera House—an English composer, to boot—finds it necessary, by way of attraction, to announce a version of Ricci's feeble 'Scaramuccia,' we ought, perhaps, rather to hide our faces in shame, than

to cavil at the mistakes of our neighbours. One word more about native artists: it is at the coming Worcester Festival that Miss Clara Novello will first let the English hear what two years of continental success have done for her. We cannot close this paragraph, without recommending to the best attention of all who love the art, the Society of Female Musicians, recently formed, for the relief and support of such ladies, as are, by position, excluded from the benefits of the long-established Royal Society of Musicians.

Our readers will probably have learned from the daily papers, that the *British Queen* arrived, all safe and well, at Portsmouth, early on the 15th, having performed the voyage out and home, discharged one cargo and taken in another, within thirty-five days, or little more than a month! The *Great Western* cast anchor in Bristol roads on the 14th. Well does our transatlantic correspondent ask, who will pretend to foretell or foresee the consequences of such things? They deserve indeed to be recorded, as evidence of the progressive steps of a revolution, of which no man can predict the result.

Closing of the Present Exhibition.

BRITISH INSTITUTION, PALL MALL.

The GALLERY, with a selection of PICTURES by ANCIENT MASTERS of the Italian, Spanish, Flemish, Dutch, and French Schools, is OPEN DAILY, from Ten in the Morning until Six in the Evening; and will be CLOSED on SATURDAY, August the 24th.—Admission, 1*s.*; Catalogue, 1*s.*

WILLIAM BARNARD, Keeper.

NOW OPEN.

DIORAMA, REGENT'S PARK.

NEW EXHIBITION.—THE CORONATION of HER MAJESTY QUEEN VICTORIA, in Westminster Abbey, and the INTERIOR of the CHURCH of SANTA CROCE, at Florence, with all the effects of Light and Shade from Noon till Midnight. Both Paintings are by LE CHEVALIER BOUTON.—Open from Ten till Five.

ROYAL GALLERY OF PRACTICAL SCIENCE,

ADELAIDE STREET, WEST STRAND.

A Musical Performance on Reisner's improved Accordion, by Vital Reisner, aged 11, principal player on that Instrument at Paris, takes place daily. The Polarization of Light, by Mr. Goddard's Polariscope. The only living specimen of the celebrated Electric Eel ever brought to this country. The Invisible Girl, Steam Gun, Oxy-hydrogen Microscope, Chemical, Electrical, and Optical Illustrations, &c. &c.

Open daily at Ten A.M. Admittance, 1*s.*

THAMES TUNNEL,

OPEN to the Public every Day (except Sunday), from Nine in the Morning until Dark.—Admittance, 1*s.* each. The Entrance is near the Church at Rotherhithe, on the Surrey side of the River. Both Archways are brilliantly lighted with gas.—The Tunnel is now 910 feet; and the Shield has been advanced to within 10 feet from low water mark on the Middlesex shore.

Thames Tunnel Office, By order.
Walbrook Buildings, Walbrook, JOSEPH CHARLIER,
August, 1839. Clerk to the Company.

TO CORRESPONDENTS.

TEN days or a fortnight since, a strange brochure came under our notice, entitled 'A Third Preface to A Treatise on Wood Engraving, by W. A. Chatto.' In running hastily over it, we were startled to find ourselves made parties in a quarrel we had hardly heard of, and our conduct vituperated in the coarsest language by a person wholly unknown to us. The charges preferred against us appeared so absurd, that, instead of replying, we took up Joseph Fume's 'Paper of Tobacco,' a work written, as we understood, by this same Mr. Chatto, and gave it forthwith a helping word of praise. Circumstances, however, in the opinion of others, compel us to advert to the subject.

The substance of Mr. Chatto's complaint is, briefly, that he, Mr. Chatto, has been unjustly treated by Mr. Jackson respecting the 'Treatise on Wood Engraving,' reviewed in May last (Nos. 601, 2, 3,) in the *Athenæum*. Mr. Jackson has stated in the Preface, and as a brief history of the origin and progress of the work, that he had long been in the habit of noting the mistakes made by authors when writing on the subject of wood-engraving, in consequence of their knowing nothing of the practice of the art, and of engraving, at his leisure hours, fac-similes of everything he thought worth preserving, when he was fortunate in procuring the assistance of Mr. Chatto,—thus, (says Mr. Chatto,) assuming to himself the credit of nearly the whole work, literary and artistic, and representing me as a person merely employed to put his memoranda into readable form; whereas, "the work was originally projected by me," and when I "first mentioned it to Mr. Jackson, he had not a single old wood-cut in his possession," and has not now even "seen most of the original cuts described or noticed" therein—indeed the work as originally printed, and seven out of the eight chapters as published, were wholly written by me, the anecdotes and information received verbally from Mr. Jackson, relating to the practice of the art, not amounting altogether to two pages. Mr. Chatto further charges Mr. Knight, the publisher, with being a party to the deception, and finally states, that they "contrived" by "a paltry bribe" to the Editor of this journal to have "the work reviewed *as if Mr. Jackson was the author*, before it was published." Fortunately, specific proofs of the injustice of the *Athenæum* are referred to by Mr. Chatto, and they are as follows:—in "speaking of the cuts of the Speculum," the *Athenæum*, with "the *peculiar* truth which characterizes the review, says, '*Mr. Jackson* pronounces their style similar to those of the Poor Preacher's Bible:'" again, in reference to the Cunio hypothesis, we observed, "Heineken, Huber, Bartsch, and *Jackson*, prove its utter untruthfulness." Here is *every tittle of injustice* which Mr. Chatto adduces or alleges against us, to justify his personal attack on the Editor!

We will not waste a moment in noticing certain obvious contradictions in Mr. Chatto's statement, but proceed at once to record the facts so far as we are concerned,

When we first saw the announcement of the Treatise on Wood Engraving, *we knew nothing of any of the parties connected with or concerned in the publication*. The subject, however, appeared to us one likely to interest our readers, but which could not be satisfactorily treated of without illustrations, and we wrote to know whether we might be allowed the use of such wood-cuts as should appear to be necessary for the purpose of the review. The request was obligingly complied with, and a copy of the work forwarded. It was manifestly impossible to distinguish on every occasion the contributions of Mr. Chatto from those of Mr. Jackson, in a work written *in the first person singular*, and accordingly throughout our notices, as we believe,—except in *one* instance, here adduced, or when the reference was made to a judgment passed on a work of art,—the reviewer spoke of "*the author*." In justice, however, to both parties, we thought it right distinctly to set forth their several claims and labours. Accordingly, after giving an account of the practice of the art, we observed:—

"We are now better prepared to discuss the HISTORICAL PORTION of the volume, WHICH IS WRITTEN BY MR. CHATTO; Mr. Jackson, however, as we understand the preface, being answerable for the general criticism throughout the work," (*ante*, p. 325, col. 1.)

Yet, though this passage stared him in the face in the very first notice,—Mr. Chatto comes forward, with an offensive personal attack on the Editor for having taken *a bribe to suppress his name and all mention of his share in writing the work!* Mr. Chatto is fierce at the injustice done to him by suppressing his name in the title-page of the work, which *ought to have been*, he says, 'A Treatise on Wood Engraving, Historical and Practical; *the Historical Portion by W. A. Chatto*, the Practical by J. Jackson.' Why, Mr. Chatto desires only to set forth his claim *in the very words of the Athenæum!*

Mr. Chatto, however, cannot even yet be allowed to escape from us. If a fraud has been committed on the public, we will forthwith show that he was a party to it; and that if we were deceived, he helped to hood-wink and blind us. Mr. Chatto *now* tells us that *he* projected the work, that he wrote it, and that Mr. Jackson has never even "seen *most of* the original cuts described" in it. Now, how will he reconcile these assertions with the following statement *in his own printed preface?*—"It is but justice to Mr. Jackson to add, that the work was commenced by him, at his sole risk, that *most of* the subjects are of his selection, &c. The credit of commencing the work and of illustrating it so profusely, regardless of expense, is unquestionably due to him." Again, if it be so absurd in us to couple the names of Heineken and Jackson together, that nothing less than a bribe can explain the circumstance, how is it that we read early in the second chapter (p. 87) such a passage as the following?—

"Of this book,"—the 'Historia seu Providentia Virginis Mariæ, ex Cantico Canticorum'—"*according to Heineken* there are two editions. The principal ground on which he [Heineken] determines the priority of the editions, is, that in the one the text is much more correctly given than in the other; and he thence concludes that the most correct would be the second. A wood-engraver—*on this point I speak from experience*—would be much more likely to commit literal errors in copying manuscript, than to deviate in cutting a fac-simile from a correct impression." Now, what *experience* has Mr. Chatto had with reference to this subject? Which of the two, Jackson or Chatto, does the reader naturally assume to be the writer of this paragraph? Is it then so very strange in us to have coupled Heineken and Jackson together, when we found them thus coupled in the very work under review?

"A word or two as to "the bribe," and we have done. Whether Mr. Chatto has taken leave to *say* more than he was willing to hazard in print,—for, in the pamphlet before us, though he talks of "a bribe," he may escape from the moral consequence of circulating a falsehood by protesting that he meant only "the loan of a few wood-cuts," which in another place *he calls* a bribe; or whether it be that others have given to his insinuations "a local habitation and a name,"—it has been, we are informed, reported that the Editor received 100*l.* from Mr. Jackson, to review the work, and that Mr. Knight paid the whole expenses of the additional illustrated sheet given with No. 603. Personally, we are indifferent to such absurd calumnies. Others, however, are of opinion that as certain "good easy people" profess to wonder, and therefore, to a certain extent, to believe, it is our duty to contradict that report. In deference, therefore, and in deference only, to the judgment of others, we now state that the assertions are wholly and unconditionally false: that we never received one sixpence from any human being to induce us to insert that or any other article, or for altering or qualifying any opinion therein contained, or *ever* published in the *Athenæum*; and that the whole cost of the additional illustrated sheet was defrayed by the proprietors of this journal. Bribed, indeed! Yes, after this protitless fashion we are bribed a dozen times in a twelvemonth. We were so bribed by Mr. Barry, who kindly favoured us with the plan and elevation of the New Parliament Houses, which, notwithstanding, cost the proprietors four or five hundred pounds. We were so bribed by Mr. Jackson, whose permission to use the wood-cuts cost us at least a hundred pounds. We are bribed this very week by the Council of the Royal Society, by permission given to us to publish the valuable Reports drawn up for the guidance of the officers engaged in the Antarctic Expedition, which, that such Report might not trench on the space allotted to the general reader, is given in a double number at a cost of forty or fifty pounds. —But we repeat that, in our own judgment, the whole story was too absurd even for contradiction.

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